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PRELIMINARY STUDY FOR REVIEW

"The California Desert" is a report prepared jointly by the California State Office of the Bureau of Land Management and the Western Regional Office of the National Park Service. It is a preliminary study, primarily concerned with recreation in the California Desert area. It has been submitted to the Director of the Bureau of Land Management for his review and consideration.

It is important to note that this is a preliminary study subject to review, and the recommendations in this study are not approved or adopted programs.

To the extent that any recommendations in The California Desert are accepted, they would be implemented through the regular processes of planning, programming and budgeting.

J R Penny

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A Recreation Study of the
DESERT PUBLIC DOMAIN LANDS
OF CALIFORNIA under the
jurisdiction of the Bureau
of Land Management

November 1968

THE CALIFORNIA DESERT

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WESTERN REGIONAL OFFICE of
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THE CALIFORNIA DESERT STUDY

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CALIFORNIA DESERT STUDY

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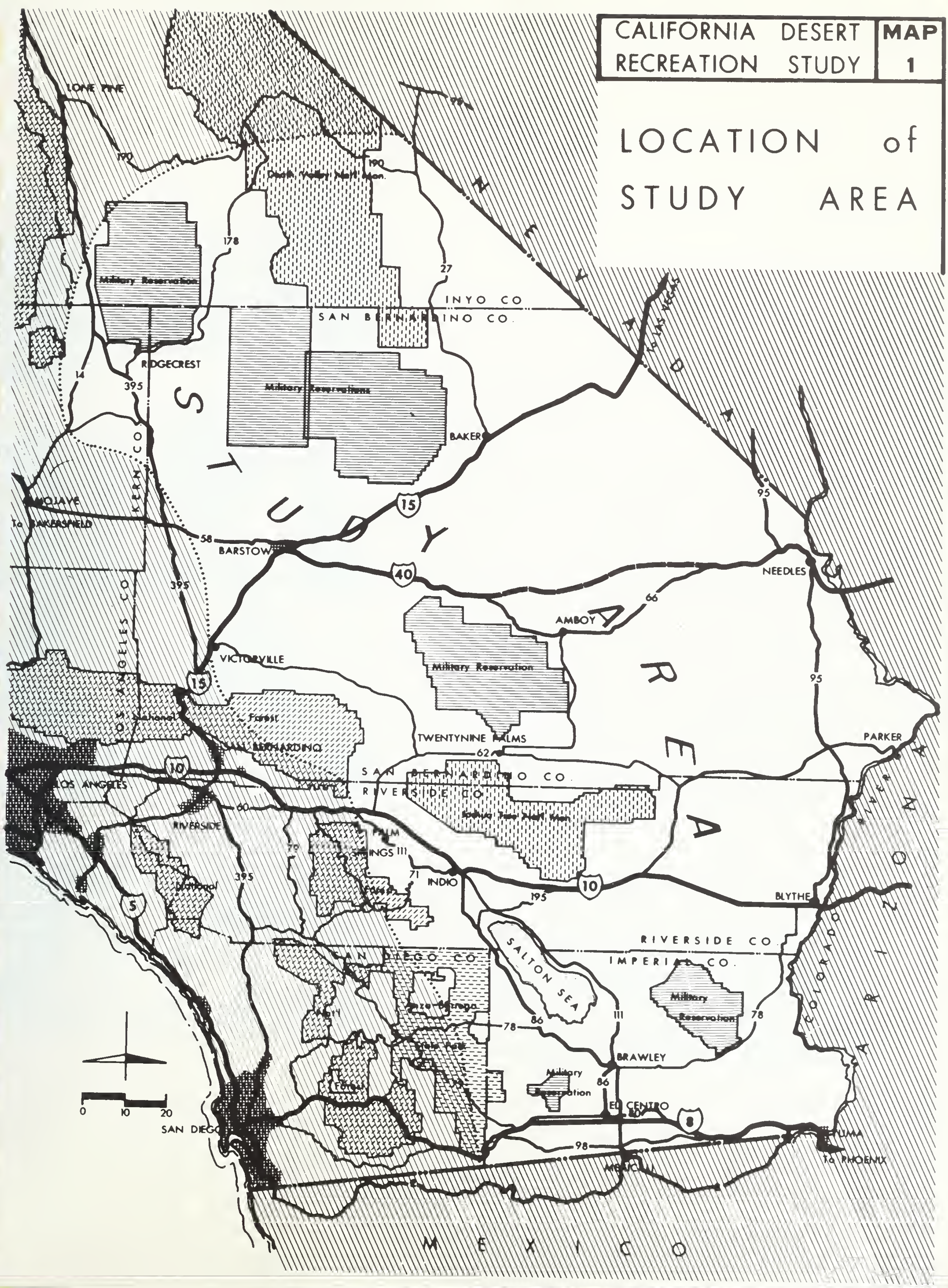
CALIFORNIA DESERT RECREATION STUDY

MAP 1

LOCATION of STUDY AREA


LONE PINE
190
178
27
190
Death Valley Nat'l Mon.
Military Reservation
INYO CO
SAN BERNARDINO CO.
Military Reservations
RIDGECREST
14
395
KERN CO
STUDY AREA
NEVADA
To Las Vegas
BAKER
15
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MOJAVE
To BAKERSFIELD
58
BARSTOW
40
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LOS ANGELES CO
395
66
AMBOY
VICTORVILLE
Military Reservation
95
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National Forest
SAN BERNARDINO
TWENTYNINE PALMS
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PARKER
10
LOS ANGELES
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RIVERSIDE CO
Joshua Tree Nat'l Mon.
60
RIVERSIDE
PALM SPRINGS
111
79
71
395
INDIO
10
National
Forest
195
BLYTHE
5
COLORADO RIVER
ARIZONA
RIVERSIDE CO.
IMPERIAL CO.
SAN DIEGO CO.
SALTON SEA
Anza-Borrego
State Park
Military Reservation
78
86
78
111
BRAWLEY
Military Reservation
86
Forest
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SAN DIEGO
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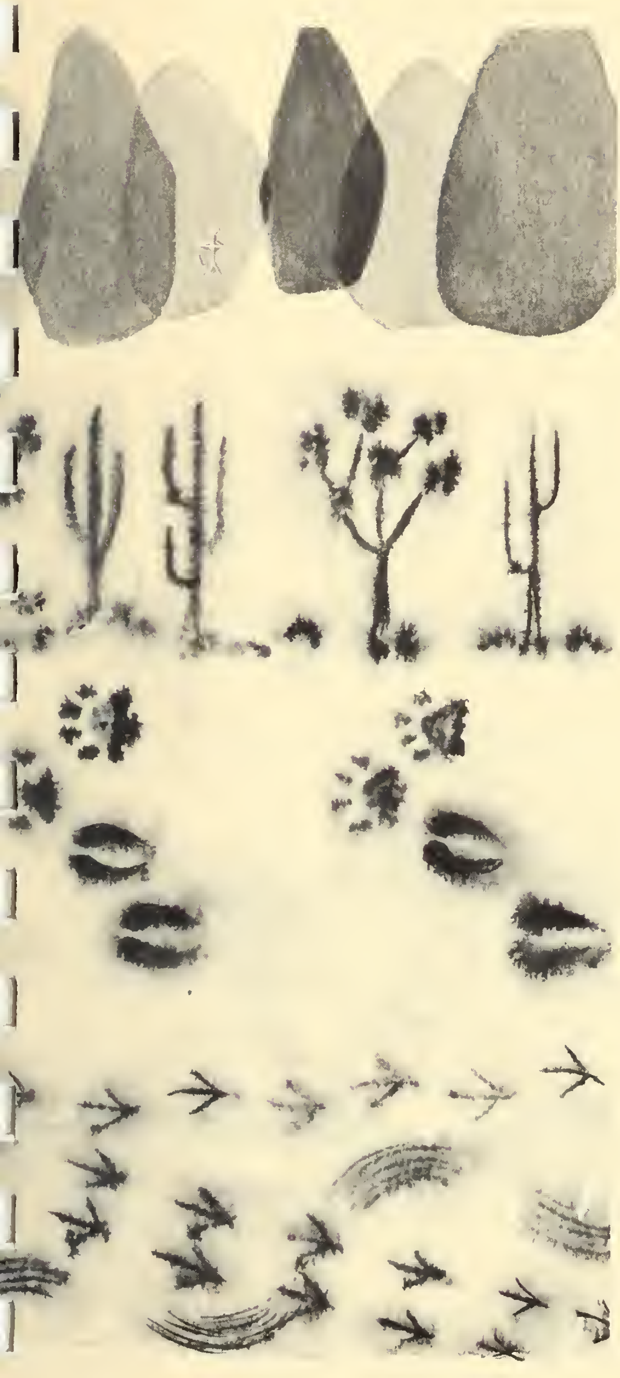


INTRODUCTION AND SUMMARY

Part I

INTRODUCTION

THE CALIFORNIA DESERT

Once, when this nation was young and the oceans were months instead of hours apart, 'land' was so plentiful that we never dreamed of a day when we would run out - there was more than enough for everyone.

But, today the American Dream has been realized; we have settled our mainland from sea to sea and we stand as a great nation astride our final frontiers.

Ours is a society with perhaps the richest land heritage in the world.

The ecologist knows that we depend upon the land - our soils, waters, our natural resources - for existence. The social scientist in recent years has learned that we depend upon the land for space as well. With our heritage, we as a people must have open land with clean water, clean air, some place to clear our minds of too much city and too many people. As a nation we need, and are placing a greater and greater premium on, that which can probably best be called 'room to roam'.

The need for open space in American cities is receiving great attention today, as well it should. Parklands near urban centers and rural open lands are important. But millions of Americans want, and probably need, something else too - wide open spaces, way-out-yonder lands, where a man can stretch himself physically and spiritually from horizon to horizon.

This is not an impossible dream!

The potential exists for meeting this American need right where the demand is the greatest.

And, the wonderful thing about it is -- virtually all the land we need already belongs to all of us as Americans. It is Public Domain. We own it.

It is the California Desert.

From the Sierra Nevada and Death Valley, the California Desert stretches south 240 miles to the border of Mexico. From the great Colorado River, the California Desert rolls west over 100 miles to lap at the very borders of Los Angeles. Over 16 million acres of starkly beautiful land, filled with a multitude of wonders; from sea-level sagebrush flats to range after range of high desert mountains, the California Desert is ours to use - or to destroy.

For this is not some never-never land on the edge of the world. The California Desert lies literally within minutes of 10 million people! And the ticky-tacky box dwelling, smog shrouded, freeway flocks pour out upon the desert at every opportunity to play and rest and breathe and stretch their arms, a tribute to the healing powers open land has for our society.

It may be a fatal tribute.

People come, and they bring their box-like houses and beer cans their smog and freeways with them. People come to stay, and they are chewing into the edges of the desert, and by trying to reshape the desert so they can stay, they are destroying the very thing they sought in the first place.

Unfortunately, the desert seems unlimited. It is so big, so vast, that there appears to be room for everyone, and everything. Because of this illusion, our nation has played tic-tac-toe on much of the southern California Desert region for a hundred years. This land is repetitively scarred with ever-increasing road and utility rights-of-way, pockmarked by past, present, and speculative mining operations, desecrated by substandard construction, littered with trash and debris, and plundered of its natural and scientific values, creating at times a ghetto atmosphere.

The desert is a storehouse of wealth, capable of serving many needs and many uses. It cannot, however, be considered from a single point of view. In fact, the single purpose approach has been responsible for many of the problems that exist there today.

The desert has land for grazing - cows, horses, sheep, even burros. It has wildlife species ranging from bighorn sheep to Gambel's quail, from coyote to kangaroo rat. It has mining, with mineral values that range from gold and silver to sand and gravel, and sometimes unique deposits of rare minerals with names that few people can even pronounce. These same minerals are often the quarry of rockhounds who pursue them as avidly for recreation as any prospector ever did to 'strike it rich'. The desert has rare beauty, and unique values. Three National Natural Landmarks have been established on Public Domain lands in the California Desert, and many more should be.

Where water occurs, or is brought to the desert, there is agriculture, often lush crops over extensive growing seasons. And, this water brings people to play - to swim, to fish, to water ski, to relax.

There are subdivisions, and desert cabins, and little towns, and big cities that are spewing into the desert. And, there is also solitude, some of the few places left where it is still possible to go and be alone.

Sometimes it seems as though the desert is just there to be crossed, with highways, and secondary roads, and dirt roads, and railroads, and trails. There are fences and powerlines, aqueducts and pipelines. There is land for the military for bases and testing grounds; for universities for studies and scientific research.

Wherever roads and trails go on the land there are people. Where there are no roads, people are pushing over it in jeeps and on motorcycles.

And some day we may just run out.

The desert is limited. Its resources are exhaustable. In truth, the desert is fragile. The struggle for existance is harsh, and the delicate balance between soils, plants, animals, water, and air can be damaged for decades or destroyed by thoughtless exploitation.

Once we did not need these lands. They were passed over in the great push west. Long ignored, they are now engulfed in the tides of western expansion.

We are no longer the society we were 100 or 50 or even 20 years ago. The demand for these desert lands today is great. It was so simple in the past for the American people to be absentee landlords of land no one wanted. Today, if we cannot look ahead, understand and appreciate the pressures on the desert lands, and provide wise management for their use, we may very well lose for tomorrow the great natural, scientific, economic, and social values that are waiting there. Worse, we may desecrate and irretrievably destroy our heritage of open space and vast horizons.

Land management is now a problem and a challenge, not only of manipulating these lands themselves, but of managing the people for whom these lands hold such promise. We, as a people, must make the decisions, soon, to determine how we will use these lands so they will best provide not only for us but ,for those who come after us.

It must be soon, because we find, even on the California Desert, a pattern of land ownership and use that is making management more difficult. This pattern is perhaps an accident of history. It is what remains after years of homesteading, desert land entries, mining claims, and wholesale grants to states and railroads.

But, it is not too late .... yet.

Most of the land in the California Desert is still Public Domain - nearly 11 million acres. It belongs to the people of this country, who have entrusted it to the stewardship of the Bureau of Land Management in the U. S. Department of the Interior. Just over 20 years ago, BLM was born, the offspring of a marriage between the old General Land Office and the Grazing Service.

Enmeshed in a net of land laws, many of them archaic, with no clear legislative direction as to the long range future of the Public Domain, BLM worked, largely unknown to the American people, at its steward's task. Then, in 1964, in an atmosphere of understanding for ecological principles and modern conservation concepts, Congress passed two of the most significant land laws in our history. One law established the Public Land Law Review Commission. The other, companion, law set up the classification and multiple use program.

Thus, our nation officially recognized, for the first time, that some of the Public Domain should be retained in the ownership of all the people and managed for multiple use purposes.

It was in the process of classification under these new laws, when BLM went to the people to find out just what uses the true landowners wanted to make of their land, that the tremendous recreational demand for Public Domain land became evident. In the mid-1960's BLM had an opportunity to look at the California Desert in its new perspective.

The view was revealing.

People were using the desert. They were scattered out over millions of acres seeking a tremendous variety of outdoor recreation experiences. Old ideas had to be discarded. Old laws and regulations did not match the facts on the ground. When the mining law of 1872, or even the landmark Taylor Grazing Act of 1934, was passed, the most foresighted of men could not have dreamed of a day when Americans would be spending nearly half a million days a year roaring back and forth across the open desert on motorcycles ... for fun.

The age-old desert panorama was still there, but a new ingredient had been added - people. People had invaded the area with new ideas, with leisure time, with a pioneer spirit, and with new technology that let them use the desert in ways never before possible. And, most of all, there was pressure, competing demand, conflict with existing uses.

The moment of truth was at hand. Natural resources needed to be inventoried; activities, recreational and traditional, evaluated; multiple-use priorities established; deficiencies identified; and, more than anything else, a plan for action formulated. As the principal landholder, BLM was being called upon by the State, Counties, Cities ... by the people, to take the lead and identify its role in the future management of the Public Domain in the California Desert.

So this is why there is a California Desert Study. It is the first chapter in a vital program for all of us as Americans. The study takes a first hard look at the facts about the California Desert, its resources and its uses. Some of the information was readily available, other facts and figures were gathered for the first time.

Out of these data, certain concepts and recommendations have been formulated, ideas that are basic to the future of the desert lands. The Concepts and Recommendations of the Study are but the first step in a process of decision for BLM and the people of this country. A great heritage is in their hands -- in your hands -- to manage and enjoy or to damage and destroy.

THE CALIFORNIA DESERT STUDY

Objective of the Study

The California Desert Study is the first step in assessing the development and management of recreation on Public Domain desert lands.

This initial study of the California Desert, its resources and its uses, has clearly demonstrated two facts. First, this desert land has a great potential for providing outstanding recreation, and is, in fact, serving far more people than had been realized. Second, the tremendous demands being placed on desert lands for recreation and many other uses can soon lead to the reduction or total destruction of a wealth of outdoor recreation opportunities.

It is the objective of the California Desert Study, therefore, to analyze the existing situation in the desert area as it pertains to recreation; to develop a broad new conceptual framework based on sound multiple use policies for the management of Public Domain lands in the California Desert; and to make recommendations for action to be taken by the Bureau of Land Management to conserve, develop, manage, and encourage wise recreational use of the California Desert and its resources in the interest of all Americans, who are the true owners of this land.

History of the Study

If the California Desert Study had any definite beginning, it was February 16, 1968, when the Western Regional Office of the National Park Service agreed to undertake certain parts of the study to assist the Bureau of Land Management in analyzing the recreational use of the California Desert. But the need for the study and the ideas that led up to it go back over the past two years.

The California Desert Study recognizes current programs of classification, resource analysis, and land use planning being conducted by BLM. In fact, the basic land classification program helped to reveal the potential and problems of the California Desert Area. This Study does not replace or overlap BLM's efforts to gather data on the Public Domain resources or institute systems for land use planning.

However, this study recognizes the urgent need for immediate action in the California Desert.

The demand for desert recreation, and the immediate threats to a multitude of valuable desert recreation resources are real factors today and must be considered now.

The California State Office of the Bureau of Land Management became seriously concerned over the situation in the California Desert during 1967. Through that year, and into early 1968, some preliminary ground work was done, including work on a special study of the problems associated with off-road vehicular use.

A study team with three National Park Service and three Bureau of Land Management members surveyed the California Desert area during a six-week period in March and April, 1968, to collect field data. Leading professional people in both agencies were then called on to prepare material on desert resources and resource use in their fields. Several leading national professionals in various fields, from universities and outside agencies, were asked to review and add to particular sections of the report as it was developed.

From the data, and the background reports, the concepts were formulated, and both general and detailed recommendations developed jointly by the Bureau of Land Management and the National Park Service.

What is in the Study

For convenience in reading and analysis the California Desert Study report is divided into four major sections as follows:

Part I. Introduction and Summary

This part contains a brief introduction to the California Desert, states the objective of the California Desert Study, explains how the study was conducted, and what is in it. Finally the concepts and recommendations are presented in capsule form to give the reader a rapid, overall view of the conclusions reached in the study.

Part II. The Desert Resource

This part contains the detailed background information on which the California Desert Study is based. It is divided into three sections.

Section A - General Description of the Desert

This section describes the general features of the desert, including geography, climate, population, transportation systems, and the land ownership patterns.

Section B - Natural, Scientific, and Economic Values of the Desert

This section presents background data on various resources in the desert and their uses. It includes information on geological and mineral values; ecological values including plants, animals, soils and watersheds, and the effects of vehicular use on vegetation, soils, and watersheds; and historical values ranging from ancient man through modern history.

Section C - Recreational Uses of the Desert

This section furnishes detailed data on the present and projected future recreational use of the California Desert. A thorough statistical analysis of this use is presented.

Part III. Concepts and Recommendations for the Recreational Use of the Desert

This part presents the 18 concepts and recommendations of the California Desert Study. Each of these is presented separately, with an analysis of the data, existing situation, and public need to which that concept and recommendation is directed.

Part IV - Silhouettes of Recreation Lands

One of the results of the California Desert Study is the specific analysis of the recreation demand and potential on 19 areas that have been identified as key Recreation Lands in the California Desert. This part of the report contains a general proposal for each of these areas.

SUMMARY - CONCEPTS AND RECOMMENDATIONS IN BRIEF

The recommendations of the California Desert Study are based on an analysis of the data developed for the study, and a conceptual appraisal fo the present situation on the California Desert area. The recommendations, together with the conceptual analysis and appraisal, are presented in detail as Part III of the Study.

For the purposes of this summary, a brief statement of each will be presented here. However, the reader should turn to Part III and review in detail the background material which is a part of any concept and recommendation in which he is interested.

A. IDENTIFYING "RECREATION LANDS"

As a start on identifying the Recreation Lands in the desert, 19 areas were reviewed in this study and all were found to have significant recreation values. These Recreation Lands will be classified for retention in public ownership and comprehensive land use plans developed to insure that recreational values are not impaired or destroyed. Appropriate Departmental policies should be strengthened to recognize recreational values.

It is recommended that BLM work with user groups to encourage techniques and develop plans for resource use that will protect desert values.

B. BOUNDARIES OF "RECREATION LANDS"

For the 19 Recreation Lands areas included in this Study, as well as Recreation Lands areas in the desert that may be discovered or recognized in the future, criteria should be set up for determining boundaries to include all potential recreational, historical, natural, and scientific values. For orderly transition into these areas, buffer zones and approach corriders should be considered; where, by the use of various land management alternatives, multiple use would be facilitated to minimize impairment of recreation values. The assistance of recognized scientists and other authorities should be obtained in identifying these areas and in determining how best to conserve and interpret the values for recreational and educational purposes.

C. USE, SALE, OR TRANSFER CONSIDERATIONS

Special uses, sales, and transfers of Public Domain lands in the desert have occurred in the past without being evaluated fully for the best overall management of the California Desert. Within the framework of strengthened Departmental policies recognizing recreational values, BLM should evaluate all special uses, sales, and transfers with consideration for these values in the multiple use management of Public Domain lands in the desert. BLM should work with the mining industry to develop the means to control surface resource damage, where mining is involved, that do not preclude the opportunity for legitimate mining enterprises to adequately explore and extract valuable minerals. As it is essential for BLM to have knowledge of mineral activities on lands in the Study area, consideration should be given to the adoption of a mining claim recordation statute under U.S. mining laws. Recreation Lands areas would provide for recreation, scientific study, and desert resource protection under the responsibility of one management agency.

D. WITHDRAWALS AND EXCHANGES

There are lands in the California Desert that are valuable for recreation which have been withdrawn by other agencies but are surplus to these agencies' needs. BLM should consider, in a comprehensive plan for the California Desert, those key withdrawn areas with high recreation uses and estimate the funds and manpower necessary to clear the land of ordnance and unauthorized use. These estimates should be incorporated in budget requests implementing BLM's programs in these areas. Legislative authority should also be sought to expedite the judicious exchange of public and private lands for more economical and efficient administration. This authority should include the use of money to equalize values in land, as well as the acquisition and exchange of interests in lands.

E. VISUAL POLLUTION

BLM should fully consider the visual appearance of the desert in all future development on public lands and should take action to minimize or erase existing scars on the desert landscape. Visual appearance should be a consideration in connection with utility rights-of-way, mining activity, construction, residential occupancy, military operations, roads and highways, use of vegetation, and recreational activity.

F. DESERT PROTECTION

Legislative authority should be sought enabling expeditious enforcement of rules and regulations necessary for public recreational use of the California Desert, and the protection and management of the area and its resources under the multiple-use concept. BLM should also develop greater cooperation between the land management agency and the user, with educational programs and public information material.

G. PUBLIC CONTACT AND SURVEILLANCE

BLM should set up a system of patrol for the California Desert, with uniformed rangers assigned geographic areas of responsibility. Starting as soon as possible, BLM should recruit and train a basic ranger force to handle areas where public contact and surveillance are critical. An adequate ranger force should be provided prior to the construction of additional recreational facilities to insure maintenance and protection.

H. RECREATION DEVELOPMENT

BLM should plan recreation developments in the California Desert to meet recreational demand, at the same time maintaining the unique opportunities in the desert for solitude, adventure, and separation. Facilities should be designed for campers and trailers as well as tent and open air overnight visitors. Campgrounds and areas where camping is permissible should be managed to protect fragile desert resources. Where water supplies are limited, facilities should insure the compatible use of water by campers, wildlife, and livestock. Area cleanliness and sanitation should be encouraged through educational programs, and by judicious location of trash receptacles and sanitary facilities.

I. VISITOR SERVICES - DESERT CENTER AND WAY STATIONS

BLM should plan, program, construct, and operate a Desert Center and a system of Way Stations on primary highways leading into the California Desert. The basic purpose of the Desert Center is to stimulate environmental conservation through a popular and appealing program of desert oriented public information and education. The purpose of the Way Stations is to provide necessary public services to desert recreationists and travellers, including: information; directions; interpretive services; rest stops; first aid and rescue services; camping and picnic areas; and ultimately, through concession developments, gas stations and motel accommodations.

J. CONCESSION DEVELOPMENTS

BLM should encourage concession developments and private investment in public accommodations and facilities, as the need arises, to serve visitors to Public Domain Recreation Lands on the California Desert. BLM should seek legislation to authorize this program.

K. RECREATION ROADS AND TRAILS SYSTEMS

Using existing state and county roads where possible, BLM should develop a system of recreation roads throughout the California Desert area through cooperative planning with State and local governments. The purpose of this system would be to enhance the public enjoyment of the recreation values of Public Domain lands by providing opportunities for leisurely and scenic travel. Scenic corridors along these roads should be established, where appropriate, and in these corridors lands would be retained in public ownership and so controlled as to minimize intrusions on the natural scene. BLM should also consider the Public Domain lands in the California Desert in establishing a trail system to satisfy a variety of recreational needs, while at the same time avoiding conflict with other legitimate uses.

L. SPECIALIZED RECREATION ACTIVITIES

Hunting, target shooting, rockhounding, archery, wilderness experiences, and many other diverse recreational activities are important and appropriate uses of the desert. BLM should evaluate these uses and the special provisions they may require for public enjoyment, safety, and the protection of the desert environment. Adjustments may be needed in the design of recreation facilities to accommodate specific activities. New uses, such as rocket launching, sailplaning, and chariot sailing on dry lake beds should be considered as they increase in popularity.

M. FACILITIES FOR OFF-ROAD VEHICULAR RECREATION

BLM should develop facilities for off-road vehicular recreation. BLM should also continue existing studies of this kind of use and its effects on desert resources and other users. Designated areas for off-road vehicular desert travel, exploration, and recreation should be based on these studies, and should be established as soon as possible. Control of off-road vehicle use would be undertaken where necessary to protect desert resources.

N. FACILITIES FOR MOTORCYCLISTS

BLM should work with motorcycle user groups to select areas and develop facilities for motorcycle centers on Public Domain lands where damage to the desert resources would be minimal, yet the diversity of terrain necessary for motorcycle riding and racing would be provided. In connection with these centers, BLM should designate areas where individuals who enjoy cross-country motorcycle riding can participate in this activity with minimal damage to the resource or conflict with other multiple uses of the Public Domain lands.

O. INTERPRETIVE PROGRAM

BLM should undertake a major interpretive program by providing educational and informational material about the California Desert lands to the public. This program envisions use of brochures, maps, exhibits, and signs. BLM should also develop and cooperate in environmental conservation programs for the public schools to explain and interpret the desert and its resources to our young Americans. The entire interpretive program, however, must be geared to the establishment of a ranger force and construction of Way Stations.

P. UNIVERSITY AND PROFESSIONAL ASSISTANCE

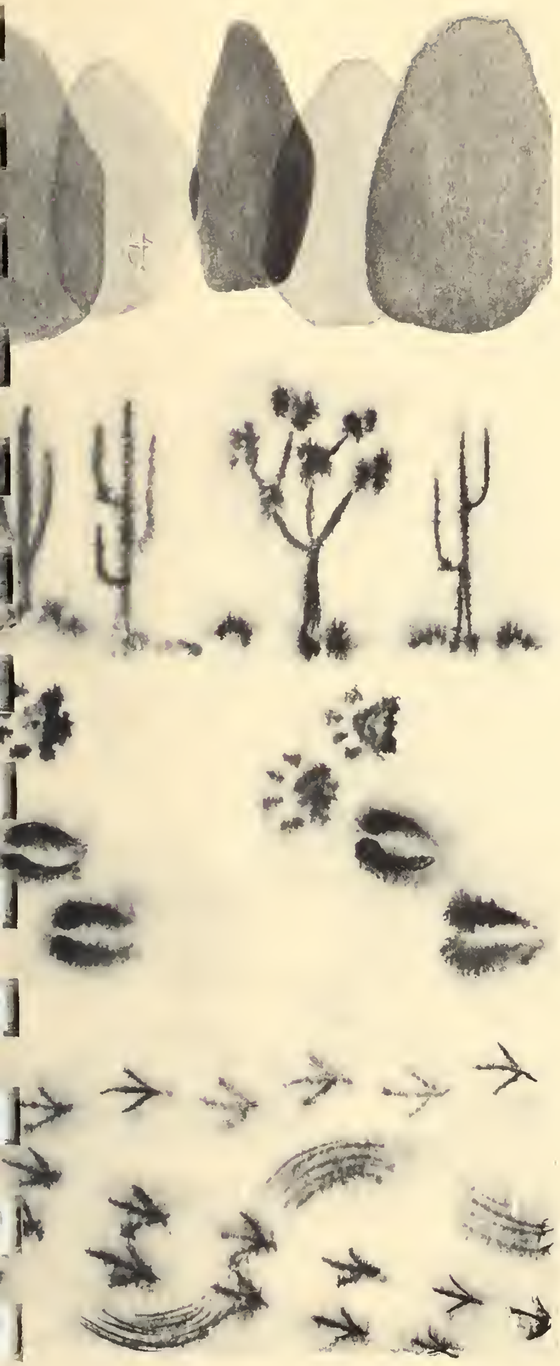
BLM should negotiate cooperative agreements with universities and other scientific institutions to recognize and identify valuable natural or scientific resources in the California Desert. BLM should also establish a system of relatively small natural or scientific areas throughout the California Desert to preserve their resources and to permit additional formal studies. Information obtained about these areas would be used in management programs and in interpretive programs for the public.

Q. CLEANUP AND MAINTENANCE

BLM should meet its responsibilities for the maintenance and cleanup of desert lands with a two-fold program. First, BLM should undertake an aggressive public information and education program to make the American public, and outdoor recreationists in particular, aware of their responsibilities for keeping Public Domain lands clean and recreation facilities in good condition. Second, BLM should handle cleanup and maintenance problems by hiring or contracting with local residents in remote areas to provide the required services and by cooperative agreements with State, county, or neighboring Federal agencies. BLM Rangers would supervise cleanup and maintenance efforts in their areas of responsibility.

R. PUBLIC PARTICIPATION AND THE DEVELOPMENT OF A DESERT PLAN

BLM should immediately develop a program to insure full public participation in planning for the future of the California Desert, including a high quality brochure on the findings of the California Desert Study. BLM should also immediately begin work on the development of a comprehensive concept plan covering all the resources in the California Desert area.



THE DESERT RESOURCE

Part II

THE CALIFORNIA DESERT RESOURCE

For all its dryness and desolation; for all its wasteland appearance; the California Desert is a unique storehouse filled with innumerable treasures of great value to man. Far from being monotonous, the desert is rich in variety. In truth, the real wealth of the desert lies in its variety; variety of history, geology, geography, vegetation, and animal life; variety also in its value to man in the forms of recreation use, livestock grazing, mining, watersheds, scientific exploration, nature study, open space, and room for urban expansion.

This part of the Desert Study contains the background information -- the facts -- on the present values and uses of the California Desert and its resources.

Part II

THE CALIFORNIA DESERT RESOURCE

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Part II

THE CALIFORNIA DESERT RESOURCE

SECTION A

GENERAL DESCRIPTION OF THE DESERT

Geography

Climate

Population

Transportation

Land Ownership

Part II

THE CALIFORNIA DESERT RESOURCE

SECTION A

GENERAL DESCRIPTION OF THE DESERT

The California Desert varies from 75 to 200 miles wide and is roughly 240 miles long, extending from Death Valley National Monument on the North to the Mexican border on the South. The east boundary follows the California-Nevada State line and the Colorado River. The west boundary trends southwest from the Panamint Valley adjacent to Death Valley through the China Lake military withdrawal to Walker Pass and then southeast through Edwards Air Force Base generally following the edge of heavy public land concentration through San Bernardino, Riverside and eastern San Diego County to the Mexican Border.

This Study covers the California Desert which is subdivided into two geographic areas: the Mojave Desert and the Colorado River, sometimes referred to as the high and low deserts. The total acreage of the Study area is over 16,000,000 acres; of this nearly 11,000,000 acres are Public Domain land under the administration of the Bureau of Land Management.

The Mojave Desert or High Desert is a wedge shaped piece of southern California extending eastward from about the northeast corner of Los Angeles County to include the lands along the California-Nevada Border and the Colorado River. The Mojave Desert is bounded on the northwest by the Sierra Nevada and on the east by the Colorado River. On the south and west, it lies against the Colorado Desert and the Transverse Ranges.

The Colorado Desert or Low Desert extends southward from the San Bernardino Mountains to the Gulf of California and is the structural trough which contains the Coachella Valley in Riverside County and the Salton Sink in the Imperial Valley. A large portion of the area is below sea level. The Salton Sink lies about 275 feet below the level of the Gulf of California.

GEOGRAPHY

The Mojave Desert

The Mojave Desert, which at its western apex in Antelope Valley in Los Angeles County is only 50 miles from the Pacific Ocean, stretches over 200 miles eastward to the Colorado River.

The Mojave Desert should not be thought of as a huge flat desert surface, for its topography is accented throughout with hills and mountains, which vary impressively in size. Melting snow and occasional cloudbursts release their water directly on the desert mountains, hills and basins.

The developed water courses carved out on the sides of the mountains and hills by previous floods carry the streams of silt, sand, and gravel ultimately to the numerous desert dry lake beds - the actual termini of these various isolated watersheds. Except for the Colorado River and its minor tributaries, drainage channels in this region do not flow to the sea.

Other than the Colorado, the Mojave River is the only stream of any magnitude in the Study area. It rises in the northeastern portion of the San Bernardino Mountains, flows north through the communities of Victorville and Barstow then northeast until it disappears into its own sink at Soda Dry Lake near Baker.

The western portion of the Mojave Desert is a plain that slopes gently eastward from the foothills of the Tehachapi Mountains to the Mojave River at a mean elevation of 2100 feet.

This plain is surmounted by isolated hills and mountain ridges which stand several hundred to several thousand feet above the surrounding terrain, with an average elevation between 2100 to 3000 feet. Shadow Mountain (4,118') Adobe Mountain (3,452'), Soledad Mountain (4,183') Kramer Hills (3,125') and Black Butte (3,584') are among the most conspicuous.

In general, the more rugged hills are rhyolite plugs, while the broad smooth domes are underlain by granitic rocks. Parts of this plain are smooth rock surfaces with a thin veneer of debris, but large areas are underlain by alluvium, which is locally quite deep.

An exploratory well drilled for oil at Rosamond Dry Lake reached a depth of 5,500 feet without reaching bedrock. Within these large alluvial basins, there are usually several playas or dry lakes. Among the most extensive of these are Rosamond, Muroc and El Mirage.

In this section of the Mojave Desert, supplies of surface and ground water have led to more extensive cultivation of the land than in the arid eastern part. Available ground water has led to the development of Hesperia, Apple Valley and California City. The sub-surface flow of the Mojave River supports many communities from Victorville to Baker. The Mojave River is said to have one of the most porous channels of any river in the United States. The river emerges from the San Bernardino Mountains, rises to the surface on bedrock at Victorville, disappears between Helendale and Oro Grande, and does not usually reappear until it flows over bedrock in Afton Canyon, 50 miles northeast.

The eastern part of the Mojave Desert shows greater local relief, more numerous and complex mountains ,and an increasing number of smaller basins.

These basins lie in progressively lower elevations from west to east; for example, Lucerne Dry Lake 2850', Emerson 2294', Soda 1,000', Bristol 600', Cadiz 600', and Danby 500'.

During pleistocene times, the Soda and Silver Lakes Playas were covered by ancient Lake Mojave. Lake Mojave covered an area of about 75 square miles and was 40 feet deep. It emptied northward into Death Valley.

Coyote and Afton Basins were one and located just east of what is now Barstow. Manix Lake, which covered an area of over 200 square miles, left fine deposits of clay and sand. It overflowed into Soda Lake Basin.

The mountains in this section are more rugged than those to the west. This is probably due to greater volcanic and more recent faulting actions. The New York mountains rise to 7,445 feet and the Providences to 6,900 feet, and are the most outstanding ranges in the Mojave Desert. The Chocolate and Orocopia Mountains in the south, Turtle, Old Woman, Bullion, Bristol, Avawatz, Granite, Rand and Calico Mountains rise above surrounding low basins.

In the middle and eastern portion of the Mojave Desert a number of lava flow areas surmounted by Cinder Cones are found. It is thought that most of this volcanic activity took place within the last 1,000 years.

Amboy Crater and Mt. Pisgah are outstanding among the numerous Cinder Cones seen from the highway, 65 miles east of Barstow.

The portion of the Mojave Desert lying along the Colorado River is from 2 to 25 miles wide. This section encompasses all of the drainage area of the Colorado River lying in California. Runoff from this province into the Colorado River is not significant.

The Colorado Desert

This alluviated area, which is less than 10 miles wide in the north and broadens to a width of 75 miles near the Mexican border, encompasses a large portion of the most productive farm land in the United States. This is due to the extensive growing season and the availability of Colorado River water. This structural trough or land form is marked by prominent faults on its borders. Their precise locations are hard to determine because of the great depth of sediments.

The famous San Andreas fault enters the Coachella Valley through San Gorgonio Pass north of Palm Springs and follows a straight course through the Indio Hills southeastward to the eastern edge of the Salton Sea.

The Indio and Mecca Hills represent land forms associated with movements along the fault zone. The volcanic belt on the southeastern side of the Salton Sea may likewise be associated with the fault zone. This area contains some small volcanic cones such as pumice and obsidian buttes and hot mud springs or mud volcanoes. On the west side of the trough is a set of complex faults. The intersections of these fault systems has caused irregularities in land form, with rugged mountain spurs projecting into the Salton trough.

It has been thought that the trough was at one time the northward extension of the Gulf of California and was separated by the delta built by the Colorado River. Recent findings tend to disprove this. Wells have been drilled to depths of 11,000 feet in the area. All en countered non-marine sands and clays with some lacustrine beds in the upper 3,000 feet. Evidently considerable subsidence of the Colorado Desert took place while the Colorado Delta fan was being built.

As a consequence of the geologic history of the valley and surrounding mountains, the present land forms over much of the trough are those associated with alluvial deposits. The streams flowing into the area have built alluvial fans around its borders, and flash floods have washed this material towards the lower parts of the basin. In the southern part of the basin, most of this sediment is part of the great delta-fan of the Colorado River. Much of the alluvium below the 40 foot contour interval is covered by a thin layer of lacustrine material deposited in ancient Lake Cahuilla.

The accumulation of large quantities of sand is another aspect of the work of water in this area. Winds from a western quarter have spread these sand deposits along the eastern side of the trough. In the Coachella Valley north of Indio are extensive areas of shifting sand dunes, the largest in the vicinity of Indian Wells. In the southeastern part of the trough lies one of the largest areas of sand dunes in the United States, the Imperial Sand Hills. The area is from 2 to 6 miles wide and about 40 miles long.

Interstate Highway 8 from El Centro to Yuma crosses the trough and is occasionally covered by sand which must be cleared.

The development in the area by man is a recent occurence, mostly since World War I. With an adequate supply of Colorado River water and additional deep well development, the area yields rich harvests of dates, winter vegetables, cotton, alfalfa, sugarbeets, melons, grapes and some livestock forage. The shores of the Salton Sea have proven to be a lucrative real estate field for promoters who have convinced thousands of the merits of desert living.

CLIMATE

Climate within the California Desert is divided into two types, as the desert itself is categorized. The two types are distinguished by the prevailing degrees of aridity and temperature ranges distinctive to the Mojave and Colorado Deserts.

Mojave Desert (High Desert)

All parts, except the higher mountain peaks, have a high summer temperature in the 100 degree vicinity. Night minimums vary from 60 degress to 70 degrees. Winter daytime temperatures range from 55 degrees to 60 degrees. Night temperatures usually drop in the low 30's. Annual precipitation varies from 5 to 10 inches, usually depending upon slope and elevation variances. Due to the prevailing clarity in the atmosphere, and the cool nights and warm days with their comparitively low humidity, health seekers, retirees, and just plain average citizens are seeking and using the desert in ever-increasing numbers.

Colorado Desert (Low Desert)

The Salton Sink and a narrow area along the Colorado River are two of the hottest areas within California and usually have the highest humidity of all desert land. The average daily maximum temperature rises to 100 degrees or more for approximately 100 days a year.

Average low temperatures for the same period are in the 70's. Winter temperatures average in the high 60's and low night temperatures in the high 30's. Annual precipitation averages below five inches. Precipitation occurs during the winter months with flash storms in the late summer months. Airflow from the Gulf of California sometimes brings comparatively high precipitation in August, however, 60 percent of the 3" to 4" annual precipitation usually occurs in the winter. Recreation and tourism is high in the winter months and tapers off during the hot summer months, except for the Salton Sea where hot June, July, and August weather improves fishing.

POPULATION

In 1968 the California State Department of Finance estimated the State's total population at 20 million. This was a net increase of 4 million since 1960. By 1980, they estimated that the State's population will reach 26 million. Projections to the year 2000 indicate that California population will exceed 38 million.

In 1967 there were 7 million people living in the city and county of Los Angeles and 3.6 million people living in Orange, Riverside, San Bernardino and San Diego Counties. This was 51 percent of the State's population in that year. By 1980 this percentage could rise to 55 percent of the State's projected population of over 26 million. Approximately 1700 persons per square mile are concentrated in the Los Angeles area alone. Portions of adjacent counties also have correspondingly heavy concentrations of people.

A large portion of this cramped population demands an outlet, if only for a brief weekend. The nearly 11,000,000 acres of public land lying within one to four hours driving distance from this megalopolis receive daily use pressure during all favorable seasons and high weekend pressure in many areas.

TRANSPORTATION

This 240 mile long study area is traversed by four major east-west interstate highways. The interstate system is supplemented by a network of State and County roads from the Mexican Border on the south to Death Valley on the north. Continuous contracts are being let and completed on the interstate system, rapidly bringing it to expressway standards with limited access. Beginning at the Mexican Border, Interstate No. 8 crosses from San Diego to Yuma, Arizona on the Colorado River. Interstate No. 10 crosses from Los Angeles to Blythe, California on the Colorado River and continues on to Phoenix, Arizona. Interstate No. 15 crosses from San Bernardino to Barstow and Baker and continues on to Las Vegas, Nevada. Interstate No. 40 bisects the center of the Mojave Desert from Barstow to Needles on the Colorado River. These east-west interstate routes carry the bulk of the tourists through the study area at the following daily averages:

1. Interstate No. 8 at California - Arizona line, Yuma, Arizona - 7200 cars per day.

2. Interstate No. 10 at Blythe, California, east city limits - annual daily average 10,600 cars.

3. Interstate No. 40 at Needles, California on State line - annual daily average 5,800 cars.

4. Interstate No. 15 at Yates Well interchange 5-miles west of the California-Nevada-Stateline - Average 7,600 cars. This is the principal traveled route to Las Vegas from California.

Primary transportation through the study area is by automobile, camper, and bus. Travel to the desert area for recreation purposes by air is on the increase. However, only local and private landing strips exist at Needles, Barstow, Apple Valley, Blythe, Indio, Yuma, Bishop, Baker, and other isolated population centers.

Other means of access within and through the area are dune buggies, four wheel drive vehicles, motorcycles, 'tote goats', horseback riding, and hiking.

LAND OWNERSHIP

Within this study area of over 16 million acres, the Bureau of Land Management has the jurisdictional responsibility for nearly 11 million acres of Public Domain land. Military reservations are probably the second largest land holdings which encompass about 3 million acres. Joshua Tree National Monument includes 454,000 acres. There is a significant checkerboard pattern of state school sections and railroad lands with Public Domain lands.

Principal land jurisdictions and ownerships include:

Bureau of Land Management, U. S. Dept. of the Interior

Department of Defense

Southern Pacific Land Company and other railroad lands

State of California

Private land owners (non-railroad)

Bureau of Reclamation, U. S. Dept. of the Interior

National Park Service, U. S. Dept.of the Interior

Bureau of Indian Affairs, U. S. Dept. of the Interior

Counties and municipalities

Under present conditions of limited recreation development in much of the study area, legal public access to and through public lands is generally adequate. But, there are potential problems where large areas of checkerboard land ownership do occur through the central portion of the area in San Bernardino County.

A greater portion of the private sections in the checkerboarded areas are owned by the Southern Pacific Railroad. This company has maintained a policy of retention and management of their holdings for many years.

Any mass title transfer of railroad lands or state-owned lands could necessitate a major revamping or reclassification of Public Domain lands within this extensive area. Where railroad lands have previously been sold to private parties in other portions of the subject area, it has resulted in a myriad of difficult management situations with public access, land transfer, and some leasing problems which must be resolved to maintain overall resource management.

Public Domain Management

The Taylor Grazing Act of 1934 provided for conservation programs on the public lands which were intended to prevent soil deterioration and injury to the range resource. In addition, the Act attempted to promote the highest use of the public lands, pending their final disposition, and until 1964 the Bureau of Land Management managed and protected the Public Domain lands chiefly for grazing and mineral purposes, generally under a philosophy of interim management which would eventually allow for this final disposition.

In the 1950's the west-central sector of the study area experienced the impact of heavy population pressures and the eastward thrust of urbanization. Many parcels of desert lands were sold under the Small Tract Act which resulted in untimely and erratic developments. These desert lands remain today a powerful monument to insufficient management and inadequate planning.

BLM Classification

As a result of urban pressures and a rising concern over the Nation's natural resources, Congress, on September 19, 1964, passed the Classification and Multiple Use Act. The Act directed the Department of the Interior to begin orderly classification of the public lands to determine their best present and future uses. The classification process means that, by intelligent planning and full public participation, certain public lands will be classified for multiple use management while other public lands will be classified for transfer out of federal ownership.

By 1970, it is expected that all public lands in the California Desert will be classified. Indications are that about 90 percent of the land will be classified for multiple use and about 10 percent for transfer. Lands classified for multiple use will be retained in federal ownership for continued development of the natural resources, of which outdoor recreation, mining, wildlife, grazing, open space, and preservation of natural beauty are the most important considerations in the desert area.

The desert lands classified for transfer out of federal ownership will be available for local public uses, community growth, and for other uses such as residential, commercial, industrial, and agricultural. In this program, BLM is working closely with local governments to assure that Public Domain lands which are badly needed for these public purposes can be so used. BLM works with local school districts, recreation districts, county planners, if possible with every interested local entity to make certain that their needs are considered as the Public Domain is classified to insure that it is used in the best overall public interest.

Part II

THE CALIFORNIA DESERT RESOURCE

SECTION B

NATURAL, SCIENTIFIC, AND ECONOMIC VALUES OF THE DESERT

Geology

Minerals

Paleontology

Soils and Watersheds

The Effect of Vehicular Use on Vegetation, Soils, and Watersheds

Flora

Fauna

Archaeology

Ethnography

History

Part II

THE CALIFORNIA DESERT RESOURCE

SECTION B

NATURAL, SCIENTIFIC, AND ECONOMIC VALUES OF THE DESERT

Man has historically valued land in terms of the use he could make of that land. Many of the facts about the desert are thus identified in terms of use. This section of the report presents factual background information on the desert in three general groupings.

Geological Values -- these include geology, minerals and the attendant mining uses, and paleontology.

Ecological Values -- These include soils and watersheds; the effects of vehicular use on vegetation, soils, and watersheds; the desert flora; and fauna, both wildlife and livestock.

Historical Values -- these include archaeology, ethnography, and recent historical records and remains of value.

GEOLOGY

The desert is filled with strange and unusual geological features like this balanced rock in the Eastern Mojave Area

GEOLOGY

The California Desert is a region of great topographic and geologic diversity. This is evident at Dante's View in Death Valley National Monument where an observer can look down upon the lowest point in the United States or across at the distant Sierra Nevada and see Mt. Whitney, the highest peak in the United States, exclusive of Alaska.

In general terms, the rocks of southern California can be grouped into two major divisions separated by a profound unconformity. Pronounced differences in rock types, structure, and degree of metamorphism distinguish the rocks beneath this break from those above it. The rocks above the break are Upper Cretaceous (80 million years old) or younger, while those below the break range in age from Mid-Cretaceous (90 million years), to Pre-Cambrian (800 million years).

Natural Provinces

On the basis of land forms and geologic history, the desert area embraces all or portions of five natural provinces.

Basin-Range Province

The northern desert area lies within this province and is characterized by north-trending ranges, intervening valleys, and an interior drainage. The ranges are essentially fault blocks, and the valleys are fault-bounded troughs. The province extends from and includes Death Valley, is bounded on the west by the Sierra Nevada frontal fault zone, and on the south by the Garlock fault zone.

Mojave Desert Province

Immediately south of the Basin Ranges is the most extensive of the provinces. It is a gigantic wedge bounded on the east by the Colorado River, and on the north and southwest by California's two largest faults, the Garlock and San Andreas, respectively. The western half is a plain that slopes gently to the east. Rising above the plain there are numerous isolated hills. In the western half of the wedge there are a number of isolated mountain masses and linear ridges occurring without apparent pattern.

Transverse Range Province

South of the Mojave block the rugged, east to west - trending Transverse Range province is encountered. Its name reflects its orientation with respect to the north-south trending Coast Ranges, Sierra-Nevada, and Peninsular Ranges. It comprises chains of mountains and hills separated by narrow to moderately broad valleys. Its geologic structures are very complex. It is a narrow feature, and in the desert study area occupies a strip 120 miles long by only 15 to 35 miles wide.

Imperial Valley Province

Further south is the Imperial Valley province bordered by the Mojave Desert unit on the east, Mexico on the south, and the Peninsular Range on the west. This is a broad, flat, alluviated area of interior drainage that lies partly below sea level. The lowest part of the valley is flooded by the Salton Sea, an inland lake 240 feel below sea level. The older series of rocks are exposed in the mountain ranges while the valleys between are filled to considerable depths with clastic sediments derived from the adjacent mountains as well as from the Colorado River drainage area.

Peninsular Range Province

To the west of Imperial Valley and forming the southwest border of the study area are the northwesterly-trending mountains and valleys known as the Peninsular Range Province. Its high mountains, with several peaks exceeding 10,000 feet in elevation, contain the highest country in southern California. For example, San Gorgonio Mountain reaches a height of 11,485 feet.

The rocks exposed in the mountains largely belong to the older series, but there are few patches of younger rocks. The entire province can be regarded as an uplifted, westward-tilted plateau that has been broken into several elongate blocks by northwest-trending faults.

Geologic Features

There are a number of interesting geologic features in the California Desert area. Mountain areas exhibit excellent examples of folding and fault, and, in addition, there are many bold outcrops which allow detailed study of rock formations.

In the arid desert regions, huge alluvial fans form in front of the canyons, coalesce with fans from other canyons, and continue to build up until the mountains are practically buried in their own debris with only the higher peaks exposed.

The Playa or dry lake is another interesting feature of the desert study area. When rainfall does occur, runoff water accumulates in these low basins where it evaporates during the dry season, leaving behind its dissolved salts. During recent geologic times there was more water in the desert and a number of these low basins contained large, landlocked lakes. It was in one of these lakes that the famous Tufa Pinnacles were formed. As the climate became more arid, the lakes were completely evaporated resulting in economically valuable saline deposits. Death Valley, Searles Lake, Koehn Lake, and Boron are important to the desert economy for deposits formed by this process.

MINERALS

The rare earth minerals mining complex at Mountain Pass.

MINERALS

The California Desert area is blessed with a great variety and quantity of minerals. The history of many mines in the area dates back to the 1700's when the Spanish mined gold in the San Fernando Valley.

Today, mineral production constitutes a very important mainstay to the economy of the area. A review of mineral production statistics indicates that in 1967 this activity in the study area totaled some 160 million dollars. This is the value of the product at the mines.

When considering the Nation's expanding demand for minerals, including that of the local area (southern California) it is reasonable to expect a mineral production in excess of 300 million dollars by 1980. A typical example is the demand for sand and gravel. This commodity's production is now doubling every 7½ years.

The principal minerals produced in the area include:

- Iron
- Rare earth
- Borates
- Salines
- Non-ferrous minerals
- Sand, gravel, and building stone
- Talc
- Clay

Iron

The high desert area has some two dozen iron deposits. The largest of these deposits is in Riverside County, at Eagle Mountain, and its operation currently supports the West's major steel industry.

Rare Earth

In 1949 rare earth minerals were discovered at Mountain Pass in northeastern San Bernardino County.

Most of the rare earth metals are neither rare nor earthy.

Collectively, rare earths are more abundant than copper, lead ,or zinc. The term rare earths is a name given to fifteen metallic elements that are chemically similar and are always found together, in groups of four or more, in one mineral. The mineral of principal importance at Mountain Pass is Bastnasite, a fluorocarbonate containing principally Cerium, Lanthanum, Neodymium ,and Praeseodymium, but also small amounts of Samarium, Gadolinium ,and Europium.

In addition to Bastnasite, the ore at Mountain Pass contains Calcite, Barite, Silica ,and small amounts of other minerals. It is mined in an open pit, crushed and ground, and the Bastnasite separated from the other minerals by the flotation process. The 160 tons of ore processed each day yield about 16 tons of Bastnasite concentrate containing about 9 tons of the rare metals listed above.

The area has been intensively prospected for ores of the common metals during the past one hundred years but the rare earth ore was not recognized until 1949. A new plant, to process the rare earth ore, is now being constructed and will have a 600 ton per day capacity.

The Mountain Pass deposit lies on the westerly slope of the ridge. It is more than 2000 feet long and 500 feet wide and extends to unknown depths. It is the largest and richest deposit of rare earth metals in the world.

The rare earth metals and their compounds are used in the making of stainless and other special steels, in glass manufacture, and in lighter flints. A recent development is the use of the Bastnasite concentrate in a new compound for polishing plate glass. Substantial tonnages are now being used in this application. A rare earth compound is used in a catalyst for oil refining, and this is becoming very important. Large tonnages of Bastnasite are being shipped overseas and to eastern plants.

A new chemical plant is now in operation. An important product, in great demand ,is Europium Oxide for color television tubes. Other rare earth metal products will also be produced for an ever-expanding market.

Borates

The area has the unique distinction of having the world's largest reserves of boron minerals and today supplies 90 percent of the world's requirements.

Borates are recovered from two sources. First, they are obtained from lake brines such as those at Searles Lake, which supplies a significant part of the total production. Second, borates are obtained from underground and open pit mines, especially the latter, at Boron, California. The open pit operation of the Pacific Coast Borax Company is credited with the bulk of today's production. It is estimated that the yearly production of Borate minerals from the area exceeds 60 million dollars.

Salines

Deposits of saline minerals are found only in arid regions and all are the result of evaporation. The commercial products derived from saline deposits or brines include borates, bromine, calcium chloride, iodine, nitrates, potassium salts, sodium chloride, sodium carbonate, and sodium sulfate.

The undrained basins of the area are ideal localities for the concentration by evaporation of dilute mineral bearing waters. It should be borne in mind that all stream waters carry some mineral. The Salton Sea is a saline lake whose salinity is constantly increasing due to the dissolved minerals being carried in by streams and irrigation waters.

Searles Lake is a place in which water stands only after heavy rains. It contains the largest known saline deposit in California and supports a multi-million dollar chemical industry.

Non-Ferrous Minerals

There has always been a significant production of these minerals (gold, silver, tungston, copper, lead, and zinc) though they have for the past several decades been secondary to the non-metallics and salines. With the increased demand, it is expected that discovery and production of these minerals will gradually increase. Today there is a considerable exploration for copper. The possibility of finding a significant deposit is becoming more promising as time goes on.

Gold

Under the present regulations, domestic gold producers are selling on the London market. The prices now paid have stimulated considerable interest in potential gold bearing formations, but are not sufficient to generate any substantial field activity.

Silver

Today, with the increase in the price of silver, exploration is at an all time high. The desert area is witnessing the exploration and development of a major silver deposit in the Calico mining district. At the present time, United States consumption of silver exceeds production.

Sand, gravel, and building stone

At present the production of sand, gravel, and building stone from the Public Domain is small compared to its potential.

Minerals - Future Potential

With the constantly increasing demand for minerals, it is a reasonable certainty that this desert area will continue to be a very major mineral producer. There are a number of reasons for this assured assumption.

First is the vast size of the area. This desert area encompasses over 16 million acres. Within this area are varied and complex geologic formations, many of which are known to host mineral deposits. In several areas the metamorphics and plutonic rocks of the older series have a total thickness of over twenty thousand feet. Such an environment is certainly prospectively valuable for mineralization. Heretofore, geologic studies and surveys have been limited to surface manifestations. Today with the better geologic tools (especially electronic) the geologist is able to study and evaluate the sub-surface environment to depths of many hundreds or even thousands of feet. During the past decade practically all the major mineral discoveries have been sub-surface and have been made by core drilling.

PALEONTOLOGY

These ancient sediments in Rainbow Basin contain some of the most significant fossils in the California Desert.

PALEONTOLOGY

There are presently a number of known sites of paleontological interest in the California Desert. However, to date, the California Desert area has not been as productive to the paleontologist as it might have been. There are three principal reasons for this. The first is that throughout this desert area are large valleys and basins filled with recent alluvial material. Perhaps nowhere else in the world are there outwash fans like these, often thousands of feet thick, which extend for many miles along the mountain bases completely filling the valleys, often burying minor mountain ranges, and completely covering fossil evidence.

The second reason is that there are tremendous areas wherein plutonic intrusion and metamorphism have destroyed the fossil records.

The third reason is that there are relatively large areas of very old rocks; rocks so old that they either predate fossils or have undergone such changes that they now show no fossils.

Though there are not too many known exposures of fossil areas at the present time, those that are known should be identified and protected. There is every likelihood that many additional deposits will be discovered, particularly if systematic scientific analyses of California Desert areas are made.

The following known sites are of scientific interest:

Rainbow Basin (National Natural Landmark, Calico Mountains)

Excellent remains of early day animal life are found in this area. Especially noteworthy are molds of camel tracks and an extensive mud deposit containing teeth of animals. The location of the latter is apparently known to fossil hunters, as some digging has been done at one of the known sites.

Coyote Mountains (Yuha Desert)

A fine deposit of fossilized sand dollars and other marine shells is located in a canyon northwest of Fossil Canyon. These are eroding out onto the slope and are quite obvious to anyone. The need for protection is a matter of concern should collectors ever become aware of the area. While not as outstanding, Fossil Canyon and Painted Gorge both contain numerous marine fossils.

Yuha Buttes (Yuha Desert)

Here is located an outstanding deposit of marine life, with oyster shells and gastropods of primary importance. This deposit is being heavily raided by fossil collectors and steps should be taken to stop this type of activity. Signs along the U. S. Highways direct travelers into the area. These should be removed until such time as protection is afforded the fossil beds.

Coso Mountains

The Coso Mountains formation contains some of the best Blancon mammal fossils found in the entire desert area. Included are Borophagus, the largest and last of the hyaenoid dogs, Equres, the shortjawed mastodons, and Platygonus, a large peccary. At the time these animals lived the area must have been of an abundant grassland type, for the animals with high-crowned, grazing teeth were numerous.

Barstow

Near Barstow the Mannix beds have produced an unusual assortment of fossil mammal specimens. Included in the list are:

Hemicyonids - Dog-bears

Hypohippus - Browsing horses

Merycodus - Pronghorns

Dyseohyus - Peccaries

Tomaretus - Dogs

Machairodonts - Sabre toothed cats

Mastodonts - Large elephant-like mammals

Hesperocamelus - Camels

Other Areas

The character of the deposits in the Providence Mountains, Mecca Hills, Afton Canyon, and Panamint Valley strongly suggests that fossil deposits can be expected in several of the formations.

SOILS AND WATERSHED

The desert is not flat, as many think; rather it is composed of range after range of sculptured mountains, their features carved by wind and water.

SOIL AND WATERSHED

Soils

In general, the soils of the desert are light colored and sandy in texture. Since the valley fills are of alluvial origin, and are oftentimes several hundred feet deep, there is little, if any, soil profile development. Most of the surface material has been sorted and moved by water and wind before being stabilized by vegetative stand. The mountain ranges have numerous rock outcrops with exposed bedrock in many places. The mouths of drainages have extensive alluvial fans. The basin bottom or playa soils are fine textured and saline in chemistry, supporting no vegetation.

Hesperia soils and associated Adelanto, Cajon, Dagget, Mojave, and Rosamond series are typical of many hundred thousands of acres of gently sloping or valley fill areas of the desert. The origin of most of these is from granitic rock although some are of mixed origin depending on the proximity of other parent material. Most are in excess of 60" in depth and some are calcareous in lower horizons. Permeability is usually good to excessive and salinity or alkalinity would not be problematic. Soils on upper slopes and mountain tops are sufficiently deep to support excellent stands of forage grasses and shrubs where precipitation is favorable.

Two major areas of active sand dunes are found in the California Desert, the Imperial Sand Dunes and the Kelso dunes.

Much of the study area, especially the low desert, is covered with what is referred to as "desert pavement" or "varnish". This term describes a condition where a cobblestone effect is in evidence. This varnish is resistant to erosion by water and wind in areas where there are large interspaces between shrubby plants. Rapid erosion will occur if this varnish is fractured by mechanical means such as vehicles, plows, and other man made equipment. Concern about the effects of motorcycle and off-the-road vehicular use where this desert pavement exists certainly is justified and the problem merits detailed study.

Contrary to the beliefs of many people, the principal causative agent of erosion in the desert is water, rather than wind.

Although precipitation rates are low, much of it comes in the form of violent thundershowers which exceed the absorption rate of the soil, thereby creating much surface runoff. So long as a desert varnish or an adequate stand of vegetation is present, erosion is held to a minimum; however, damage to either one of the protective conditions will accelerate erosion rates tremendously, upsetting the delicate ecological balance of the desert.

Watersheds

Watersheds within the study area are composed of two types by virtue of geographical location. One type includes drainages tributary to the Colorado River consisting of approximately 3,540 square miles.

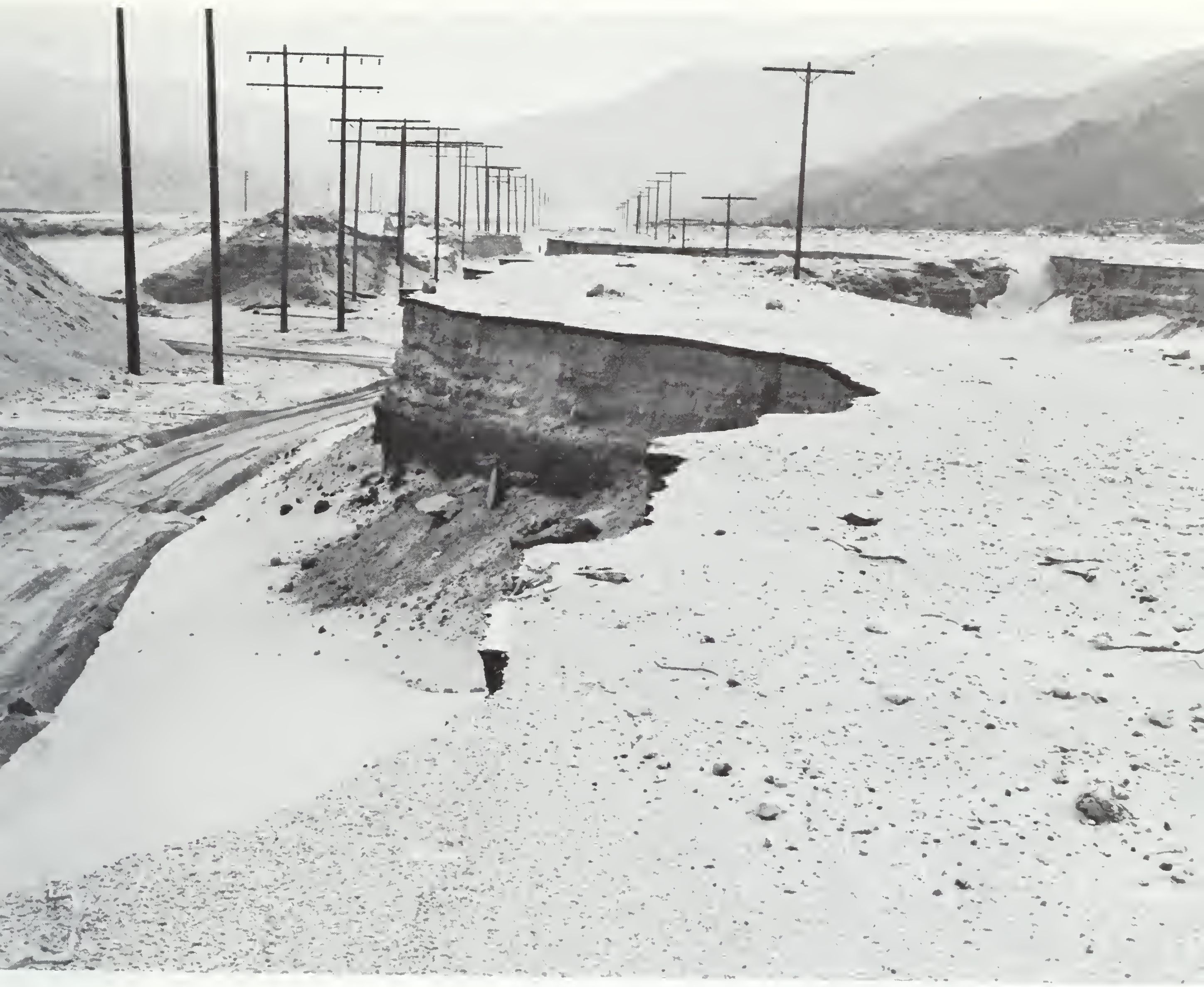
The remaining watersheds are composed of large and small closed basins with no outlet. The largest of the closed basin type is the Mojave River which begins in the San Bernardino Mountains and flows through the communities of Victorville and Barstow ending in Soda Lake, a total distance of 105 miles and with a watershed of about 217 square miles. Other intermittent or occasionally year round major streams include the Whitewater River in the Coachella Valley and San Felipe Creek, both of which drain into the Salton Sea. The Amargosa, with origin in Nevada, flows into Death Valley.

Other than those mentioned above, drainages tributary to the Colorado River and also the closed basin type, consist of dry washes, named or unnamed, varying from a few miles in length to more than 25 miles long. Only in years of exceptionally heavy precipitation or in the event of occasional torrential cloudbursts do these creeks and washes experience live flows.

Elevations within the desert area range from a low of minus 240 feet in the Salton Sea to a high of about 8,000 feet in the desert mountains. While the perimeter mountains are not a part of the desert, it is from these and other ranges that runoff from snow melt and higher precipitation provides surface and underground water supplies.

Other major mountain ranges along the perimeter of the desert include the Panamints at 5,000 feet, the Blacks at 6,300 feet, Sierra Nevada, 4,000 to 8,000 feet, San Gabriel at 7,000 feet, and the Tehachapis, at 7,700 feet.

Mountain ranges within the desert confines that provide the many closed basins include the Chocolate, Chuckwalla, McCoy, Granite, Old Woman, Kingston, Turtle, Whipple, Bullion, Sheep Hole, Iron, Palen, Coso, El Paso, Quail, New York, Providence, and numerous smaller ranges. Some of the larger ranges such as the Chocolates, lying above the Salton Sea, extend for a distance of 40 miles.



Desert watersheds, when it rains, can alter the landscape drastically.

Runoff and Sedimentation

Runoff and sedimentation data is very meager, being confined to the major streams which have caused flooding and siltation problems in the past.

The following table from the U. S. Bureau of Reclamation shows recorded flows of the Mojave River at the indicated stations:

Mojave River Discharge

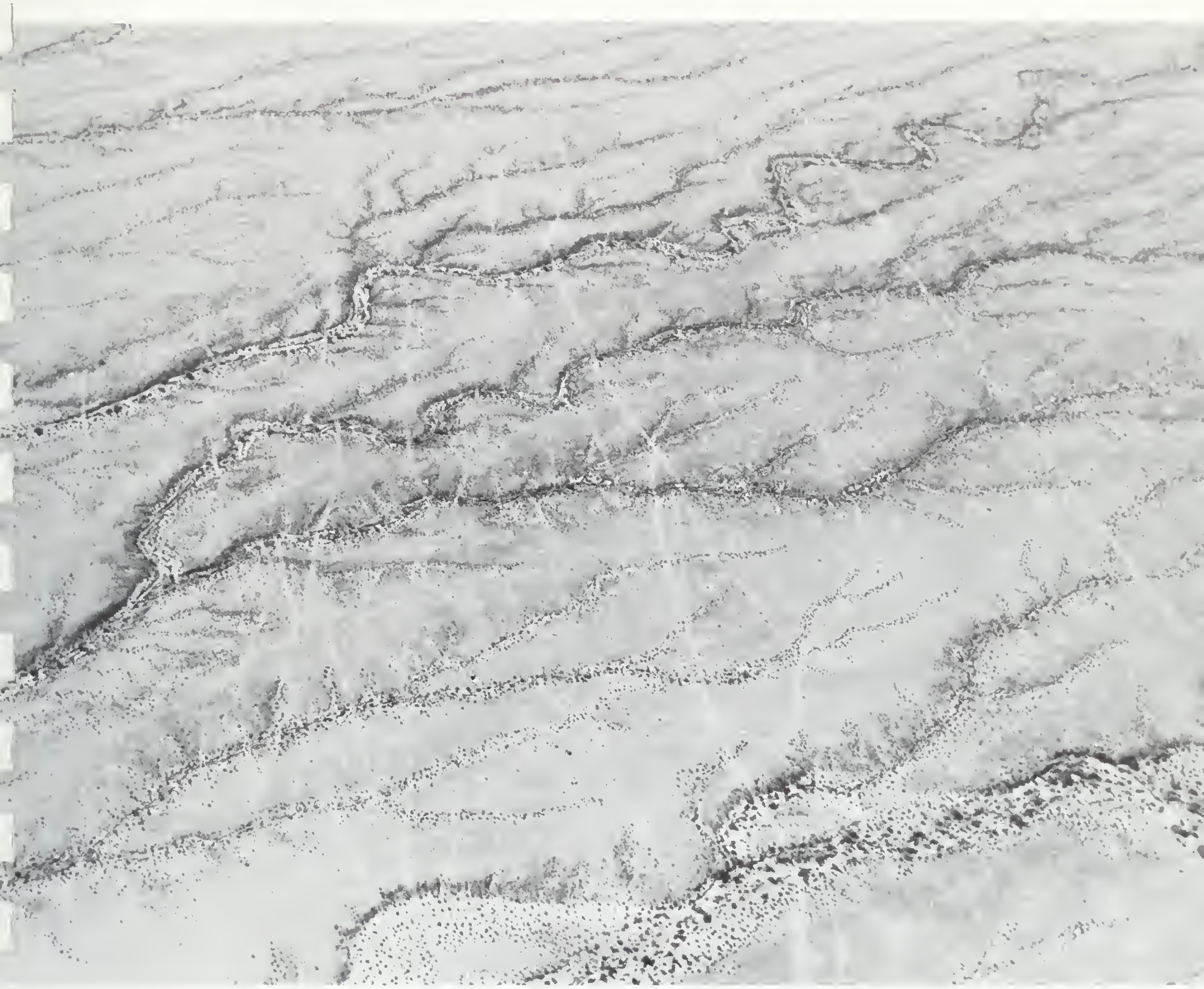
Station	Drainage Area Sq. Miles	Av. Ann. Discharge cfs	Average Discharge AC. ft/yr	Maximum Discharge cfs
Forks	75	38.2	58,800	
Victorville	514	71.0	49,100	70,600
Barstow	1,290	22.3	18,000	64,000
Afton	2,120	2.15	4,900	4,150

(NOTE: 1 ac ft. = 43,560 cu. ft. or approximately 326,000 gallons).

Forks station, at the base of the tributary high yield watershed, experiences higher annual and peak flows than those downstream. Low recordings at Afton which is farthest from the high yield watersheds is indicative of the diversions of water by upstream users plus the seepage loss through the permeable river bed soil. Although the Afton station watershed exceeds that of the Forks station by nearly 38 percent, the flow is much reduced which is further evidence of the low surface water yield of the desert topography.

Despite the low precipitation, erosion and sedimentation are active in the desert. Deposits at the Forks station of Mojave River measure 107 acre feet annually. This is projected to an estimated 11,000 acre feet during a 100 year period. However, since the station is at the base of a watershed that is relatively steep and of high water yield, this projection cannot be applied to and called typical of sediment yields throughout the desert. More typical, but unmeasured, is the alluvial fan that projects into Lake Havasau at the confluence of Chemehuevi Wash, or those extending into the Salton Sea from normally dry washes.

EFFECTS OF VEHICULAR USE



General Patton's World War II maneuvers in the desert left these tracks. This photo was taken in 1968.

EFFECTS OF VEHICULAR USE ON VEGETATION, SOILS, AND WATERSHEDS

A separate study was conducted in the desert area of southeastern California to determine the effects of unregulated vehicle use on the vegetation, soil, and watersheds.

Sites inventoried totaled 22 separate locations covering a combined area of approximately 134,000 acres and a course distance of about 940 miles. In general, 70 to 90 percent of this use is on Public Domain and the remainder on other lands.

Use areas were segregated where possible by type or types of vehicles although most areas experience an overlapping of all types. Vehicles observed were four wheel drive, small,medium, and large cycles, and dune buggies. These latter were observed largely in the two large dune areas, one of which is in the Imperial Valley and the other near the town of Kelso.

Of the total sites inventoried, two areas were selected for a more intensive and detailed study of the effects on vegetation, soil, and watersheds. One was the Jawbone - Redrock Canyon in the low hills northeast of the town of Mojave and included general use by most of the vehicles listed previously. The second site was in the relatively flat desert about nine miles south of Barstow and consisted of a 155 mile, one time use, motorcycle course. In addition, an attempt was made to evaluate the effects of training maneuvers from World War II years and those conducted more recently.

Results of Vehicle Use Study

As a result of the study, several conclusions were reached. These are final only insofar as they pertain to a one time observation of effects. Future observations and photographic evidence will record the long term effects under differing climatic and use conditions.

1. Hill climb areas where use is continued over a period of five years show more adverse effect than any other use sites. This is due to steep slopes (up to 50 percent) and a more concentrated use as compared to a cross country course. Soils are compacted more severely,often inhibiting germination of seeds,thereby preventing revegetation. Existing

vegetation is usually wholly eliminated from the hill climb slope as a result of continued use. The erosion hazard is increased from a slight classification to severe. Once erosion occurs, major portions or all of the climb areas can be lost to future use by either vehicle or vegetation. Since climb areas are elevated and easily seen from a distance, aesthetic loss is greatly magnified.

2. Areas experiencing the least effects are those of the "one time only", cross country trail rides. Where they are laid out and take place on level to slightly sloping terrain with only occasional low hills, damage to both soil and vegetation are minimal. In the Barstow course, for instance, tracks were discernible only occasionally, annual plants having germinated during the growing period following the cross country race. On the other hand, the Johnson Valley course exhibited loss of annual vegetation since the race was held during the growing period. Presumably, new annual vegetation will fill the "one time" tracks following the next growing period.

3. Continuous or intermittent use by cycles or four wheel drive vehicles on cross country trails results in considerable damage to the vegetation. Unrestricted use of large expanses of easily accessible terrain results in a crisscross and spider web of trails. Individually, trails do not result in high rates of plant loss but,collectively,plant reduction is significant. Because slopes in this type of use are usually more gentle than those of hill climb areas, soil movement is categorized as displaced rather than lost. Exceptions to this will, of course, occur in the event of a secondary movement by wind or water of the now unprotected soil.

4. Use of the dune areas by dune buggies showed that, in general, adverse effects on the soil are negligible. Since a large percentage of the dunes support no vegetation, plant losses were not a problem. However, in localized sites where conditions are favorable, some rather rare or aesthetically valuable plants do survive and propagate on the dunes and these can be damaged by vehicles.

5. Observation of old and recent training maneuver areas reveals that tracks are more easily discernible from the air than on the ground. Undoubtedly much of the woody vegetation consisting chiefly of Creosote bush and Burro brush was destroyed by the heavy tracks but there has since been some recovery by new seedlings and replacement by annual forbs and grasses. Time for the study did not permit a detailed count of plant damage or soil movement in this area.

6. The most apparent and easily measured effect on vegetation and soil is that occurring in parking and camping areas, starting points, and overlooks. The protective vegetation present is easily damaged or destroyed by the wheels of many vehicles or by use for fuel in camping areas. Continued use of this area will result in 100 percent denuding

of the site. Intermittent use may or may not provide suitable protection for annual plants. Measurements on a one acre plot were taken at a parking area and starting point for a cross country trail where 900 vehicles were gathered. The plot showed that 53 percent of the woody vegetation was destroyed or irreparably damaged. The slow rate of growth of one particular species, Creosote bush, which is present on approximately 78 percent of the desert, precludes it from becoming a dominant wind or water control device for at least 10 years.

7. A further observation of soil compaction on use areas appears to have validity. Soils having a clay content of 25 percent or higher can produce compaction problems resulting in prevention of seed germination and water infiltration or concentration of surface water flows. Since most of the soils observed in the desert area are of coarse texture with low clay content, this problem is not as acute as in other regions.

8. It was not possible to measure effects of vehicle use on the quality and quantity of water at the time of the study due to lack of precipitation and resultant nonexistent surface water flow.

9. A projection of future trends on increased use suggests that even the minimum amount of existing damage to the soil and vegetation on a single cross country trail in the creosote vegetative type could become very serious.

FLORA

The desert lily, one of over 700 species of flowering plants in the California Desert.

FLORA

Two general floral communities may be identified and generally delineated as the high desert and the low desert. Most of the high desert community is within the boundaries of the Mojave Desert, whereas the low desert regime falls within the confines of the Colorado Desert. The primary difference between these two vegetative regions is elevation; however, the level of annual precipitation and summer temperatures are contributing influences. Careful estimates by Edmund C. Jaeger, eminent authority on the desert, reveal that the California Desert supports no less than 700 species of flowering plants.

High Desert

This vegetative complex is typified by such plant species as Joshua Tree, salt bush, black brush, hop sage, big galleta grass, and desert needlegrass. The creosote bush extends over large areas of both the high and low desert. This species is no doubt the outstanding dominant plant of the desert region.

The high desert gradates into the sagebrush and juniper-pinyon-pine vegetative types in the higher elevations (4,500 - 6,000 ft.). However, since the acreage dominated by these high elevation types is so small in comparison to the high desert area as a whole, it is included within the floral community for the purpose of this discussion.

Generally speaking, the high desert occupies the elevation zone between 2,500 and 4,000 feet above sea level. Average annual precipitation varies from five to eight inches, nearly all in the form of rain.

The high desert is the most important grazing area for livestock, primarily because of a somewhat stable level of forage production. Ground cover density varies from 15 to 25 percent,thereby providing moderate protection from the forces of erosion.

During years of normal or above normal rainfall, the high desert produces an abundant crop of annual forbs and grasses. Most of these annaul forbs have colorful flowers, oftentimes presenting a variegated carpet on the desert floor during the spring months.

Typical of xerophytic vegetation, the desert shrubs have either deep or widely spreading root systems, reduced leaf surface, and tissues that can store water. Some of these plants enter a dormant state by early summer and stay in this condition until late winter when growth begins anew. This characteristic permits these plants to grow, produce seed, and store food reserves during the time of the year when soil moisture is available and the temperatures are moderate.

Low Desert

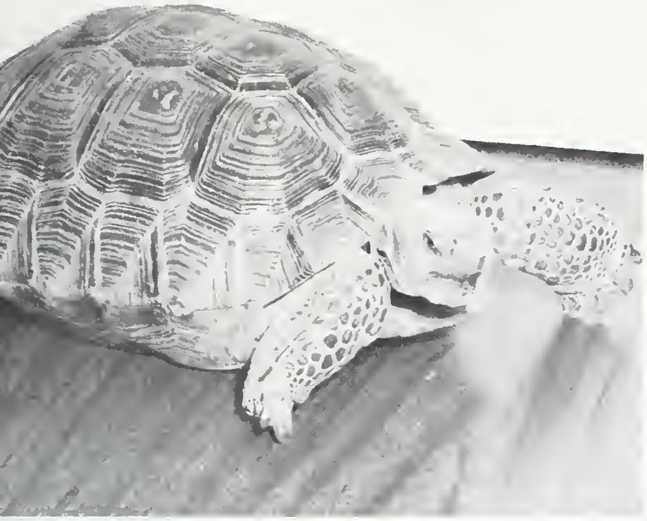
Creosote bush is probably the most dominant plant of this community; however, other species include palo verde, mesquite, yucca, cacti of many varieties, and numerous small forbs which grow in abundance during periods when sufficient moisture is available and temperature is favorable.

Average annual precipitation varies from less than one inch to about five inches. The low desert area receives most of its rainfall from spring and summer cloudbursts. This type of storm is relatively small in size and highly localized. For this reason, some of the low desert will receive sufficient moisture for plant growth, while an adjoining area may receive no measureable rainfall during the entire year. As a result vegetative growth will occur in a patchwork pattern over any given segment of the low desert region.

Of necessity, the perennial plants of this community are widely spaced, their root systems spreading out in a horizontal manner in order to obtain as much moisture from the soil as possible. The type of rainfall and soil structure limit the moisture zone that is available to most shrubby species to the upper few inches of earth. This is not true of tree forms, their root systems being very deep in order to penetrate the underground waterbearing strata. Typical of such trees are the native desert fan palm, mesquite, and smoke tree.

One plant species that grows in the low desert area deserves special mention. The giant saguaro cactus is found in picturesque groups on some of the east-facing slopes bordering the Colorado River in the Whipple Mountain Range. This is the only location where this impressive cactus grows as a native plant in the State of California.

FAUNA
WILDLIFE



Desert Tortoise

Desert Bighorn

Coyote

Gambel's Quail

FAUNA

Wildlife

The desert area supports a wide variety of wildlife species, ranging from that unique bird, the roadrunner, to the rare peninsula bighorn sheep. As is true throughout the world, certain wildlife forms are endemic to specific life zones, although some species have the adaptability to inhabit a number of life zones with ease, e.g., the coyote. There is somewhat of a general division between species of wildlife found in the high and low deserts, but there is enough overlap that a breakdown in the discussion would not prove meaningful.

Following are listings of the species or general groups of animals found in the desert, and the general distribution of some of them.

Big Game

Deer. Five subspecies are present within the desert study area. The Inyo mule deer is found in the extreme northwestern section in Inyo county in the Coso and Inyo Mountains and along the east side of the Sierra Nevadas. The Rocky Mt. mule deer inhabiting the Providence and New York Mountain Ranges are not native but were transplanted a number of years ago from northeastern California. The third subspecies, the burro deer, is found along the Colorado River. It ranges westward into the desert when rains make water and green feed available. Two other subspecies range on the western edge of the study area. The California mule deer range in the San Bernardino Mountins area. They overlap with the southern mule deer of the San Jacinto Mountains. This latter subspecies continues south through the Santa Rosa Mountains and the mountains of San Diego County.

Bighorn Sheep. Two subspecies are native to the desert study area, both of which are fully protected in California. The Nelson, or desert bighorn, inhabits many of the mountain ranges, although little is known about its numbers. Mountain ranges important to this subspecies include those in and around both the Death Valley and Joshua Tree National Monuments, the Inyo Mountains, and the Providence-New York Ranges.

The other subspecies, the peninsula bighorn, is classified as a rare animal on the Rare and Endangered Wildlife Species list compiled by the U. S. Bureau of Sport Fisheries and Wildlife. It inhabits the mountainous area on the western edge of the Colorado Desert from the Santa Rosa Mountains south into Mexico.

Mountain Lion. The Yuma mountain lion, one of two subspecies in the state, is found along the Colorado River and some of the adjacent southeastern desert ranges. The California mountain lion is generally outside the study area. It is an unprotected mammal in California; however, the bounty offered for this animal for many years was recently abolished.

Upland Game

Quail. Three species are present, although the Gambel's quail is the most widespread throughout the desert. Valley and mountain quail are distributed in the western and northwestern sections of the study area in the higher life zones.

Chukar Partridge. Introduced into California in 1932, this exotic game bird has rapidly filled an open niche in the desert ecology of southeastern California. It has continued to extend its range and increase its numbers over the years with apparently no conflict with other wildlife species.

This species inhabits the ruggedest mountain ranges, utilizing grasses and seeds where no other game bird exists. Its ability to range long distances from water sources is a very desirable characteristic where free water is a scarce commodity.

Doves. The mourning dove can be found in nearly every vegetative type in California. The desert area provides suitable habitat for substantial numbers of these birds yearlong, but great concentrations occur during the winter months as doves migrate south out of the colder climates. The largest wintering areas are in the Imperial Valley and along the Colorado River.

The white-winged dove nests in the northeastern section of the desert study area; however, it winters in Arizona and Mexico. Hunting for this species in California is limited.

Rabbits and Hares

Blacktailed jackrabbits probably have the most widespread distribution in the desert area of all the mammals. This animal is capable of existing in the most arid and rugged areas imaginable, and therefore is an integral part of the desert landscape.

Cottontail rabbits are more specialized in their habitat requirements, but are generally scattered throughout the desert region in the middle to high elevations.

Furbearers

The kit fox, coyote, badger, and bobcat are some of the more typical desert furbearers. The interesting little kit fox is a protected species. Other furbearers include gray fox, spotted skunk, raccoon, muskrat, and beaver, the latter two species being found along the Colorado River.

Rodents

A great variety of rodents exists in the desert region. Ground squirrels of several species, and a chipmunk in certain higher areas, are probably the most noticeable since they may be seen during daylight hours. Many species are nocturnal. A few porcupines are found in some of the mountain ranges, where the large houses of woodrat are also frequently seen. Other species include:

- Pocket gopher
- Pocket mouse
- Kangaroo rat
- Grasshopper mouse
- Harvest mouse
- White footed mouse
- Cotton rat
- Meadow mouse

Waterfowl

Found primarily along the Colorado River and the Salton Sea areas, migratory waterfowl also make use of the soda dry lakes should they contain water after rainstorms.

Birds - Nongame

The desert area has many species of birds, from hawks and owls of various kinds, to small songbirds. The roadrunner is a unique and picturesque bird of the desert area. An area of Public Domain in Riverside County has been withdrawn for the protection of the Poor-will. Shore birds occur along the Colorado River and Salton Sea.

Reptiles and Amphibians

Numerous species of small lizards are characteristic of the desert. In addition there are rattlesnakes, of which the sidewinder is unique to the desert. Other non-poisonous species of snakes are also present. The large desert tortoise is protected by state law. A large lizard, the chuckwalla, is present and its name has been given to a mountain range in Riverside county (Chuckwalla Mountains). The horned lizard, better known as the horned toad, is a familiar desert species.

Fish

Various warm water fish live in the Colorado River, and the Salton Sea contains certain salt water species. These areas both provide excellent fishing for a great number of people. Of particular interest to science in desert waters are two species considered to be rare or endangered. These are the endangered Mojave chub and the rare Nevada pupfish. The chub possibly still exists in the Mojave River in small numbers, but a known pure population exists in a springfed pool near Baker. The pupfish is found in the Amargosa River basin in several springs.

Feral animals

Burro. This animal exists in scattered locations throughout the study area. It became established when early prospectors or sheepherders turned unwanted animals loose or they escaped from captivity. Concentrations exist in the New York-Providence Mountain area, Saline Valley-Hunter Mountain-Panamint Valley area west of Death Valley National Monument, in the Monument itself, and on the China Lake Naval Weapons Center.

Wildlife Problems

The most significant wildlife problem facing the Bureau of Land Management is the lack of detailed information regarding habitat. This data is needed before wildlife can be fully considered in the management of the various resources, and before habitat management plans can be developed.

Water, the key to wildlife habitat on the desert, is the element around which most wildlife problems are centered. In this arid region free water is extremely scarce; if springs are piped away to residences, if human interference continually occurs around water sources, a reduction in wildlife habitat becomes a reality. This very situation has caused a noticeable reduction in the peninsula bighorn sheep range in the Santa Rosa Mountains, and is occurring to some extent throughout the desert region.

Livestock grazing has the potential of decreasing the quality of wildlife habitat, but with proper planning and consideration these potential conflicts can be avoided. BLM management plans for grazing include provisions for wildlife also using the range. In some cases, grazing and associated developments can be beneficial to wildlife habitat.

A problem of unknown magnitude is the competition between desert bighorn sheep and the feral burro. There appears to be direct competition for food and perhaps water between these two animals, but research is needed to determine the extent of the conflict.

Land ownership patterns cause problems with wildlife in certain areas. The consolidation of public land is desirable in some cases to safeguard vital wildlife habitat. Access across private lands to large blocks of public lands has been restricted in some areas, preventing use of the wildlife resource.

A problem that has recently come to light is the actual and potential disturbance of wildlife by man's recreational use of the desert. Motorcycles and other off-the-road vehicles are being used on the desert in greater numbers each year. This use occurs during the nesting period of most birds, and human harassment will undoubtedly cause nest desertion. Increased use of remote areas inhabited by bighorn sheep may cause these shy animals to decline in numbers as they are forced into unsuitable environments. Camping next to water sources prevents their use by wildlife during critical periods, a problem which is becoming more significant as this recreational use of the desert increases.

Wildlife Management

The Bureau of Land Management only recently has begun to consider wildlife and their habitat in all of its resource management programs. Wildlife habitat management planning is being emphasized, evidenced by the completion of such a plan for the New York Mountain Range in eastern San Bernardino County. A plan is in the making for the management of the peninsula bighorn sheep habitat in the Santa Rosa Mountains. These plans are being developed in cooperation with the California Department of Fish and Game.

Water development has been the principal form of habitat development completed in the desert region to date. Literally hundreds of "gallinaceous guzzlers" have been installed by the California Department of Fish and Game in an effort to extend the habitat primarily for upland game birds. These guzzlers collect rainfall on an impermeable apron and store the water in underground tanks that have access ramps for the birds. The development of springs has also been an intensive program. Development prevents pollution, generally provides for storage, and reduces the amount of water percolating back into the soil where it is unavailable. Also, small taps have been placed in pipelines leading to livestock watering troughs, and water is trickled into a small basin for use by wildlife.

As more inventory data is gathered, there is no doubt that additional types of habitat development will be completed, utilizing new, sophisticated techniques that become available.

Wildlife Economics

The major use of wildlife in the desert is in the form of hunting, although Nature study and photography are fast becoming recreational activities of significance.

The most sought-after species by hunters are the various kinds of upland game animals which include: Gambel's quail, chukar partridge, valley and mountain quail, mourning and white-winged doves, as well as cottontail and jackrabbits.

To illustrate the values of wildlife in the desert, the Gambel's quail is an excellent example: The California Fish and Wildlife Plan estimated that 530,000 birds were taken by 40,000 hunters during 120,000 hunter days in 1963. The hunting pressure for this species has increased considerably in the five years since,and it is estimated that by 1980 there will be an annual take of one million birds by 80,000 hunters, a 100 percent increase.

The value of Gambel's quail to the local economy in 1963 totaled $1,800,000 for this one species, when it is figured at a value of $15 per user day for the 120,000 estimated user days. This figure is taken from BLM Manual 1606 (April 30, 1968).

FAUNA
LIVESTOCK

Desert grazing depends heavily on good weather conditions to produce annual forage.

FAUNA

Livestock

There are over 16 million acres included within the desert study area. An estimated six million acres are unsuitable for livestock because of one or a combination of the following factors: scarcity of forage, low quality forage, lack of water, terrain that is too steep or rocky.

The grazing of livestock is administered under both Section 3 (grazing licenses) and Section 15 (grazing leases) of the Taylor Grazing Act.

Livestock Statistics

Section 15 Leases			Section 3 Licenses		
No. of Leases	AUMs	No. of Livestock	No. of Licenses	AUMs	No. of Livestock
65	126,400	20,000 Cattle 58,000 Sheep	30	50,000	5,000 Cattle 80,000 Sheep

The figures for Section 15 leases include grazing that occurs during good years where lands are leased on an annual basis.

Livestock Forage

Variability is the key word describing forage conditions for livestock in the desert region. Of the area used for grazing, approximately 75 percent is classified as producing primarily annual forage. The remainder is grazing land producing both perennial and annual forage.

High Desert

A detailed description of the region is given under the Flora section of this report. For the most part, the vegetation consists of perennial shrubs with an understory of annual forbs and grasses. Many of the shrubs are palatable to livestock, but some of these go into a dormant state by early summer. During the period when they are green, short-lived annual plants are highly sought by livestock. The supply of annual vegetation is dependent upon the amount of precipitation received each year. The presence of palatable perennial shrubs makes this region more consistent in forage production than the low desert region. Even in years when annual vegetation is in short supply, livestock can graze on the brush species and still make weight gains.

Low Desert

The mainstay of livestock operations using this region is annual vegetation produced as a result of spring and summer cloudbursts. The shrubs found here have little or no forage value. Obviously, there are extreme fluctuations in forage supplies from year to year. Some years forage is so abundant that it can only be partially utilized by livestock, and in other years production is so low as to make grazing impractical for the most part.

The conditions in this region make livestock operations quite unstable. Ranchers must have available large numbers of sheep or cattle literally overnight when forage is abundant, and yet in poor years have other grazing lands to use or another source of income in order to survive.

Livestock Operations

The highly variable forage conditions of the desert region have resulted in the adoption of several types of livestock operations.

Irregular Sheep Use

This type is found in the low desert region in the vicinity of Imperial Valley, Palo Verde, and Barstow. Grazing is limited to years when sufficient forage supplies make grazing worthwhile, and is usually for only a short period in the spring. The sheep come from stable ranches with private or leased lands in the Imperial, Palo Verde, and San Joaquin Valleys. Generally, additional sheep are not acquired for this grazing use.

Regular Sheep Use

This type of grazing occurs on the high desert lands in the northwestern section of the study area. Most of these operations are administered under Section 3 regulations, with base properties located in the lower San Joaquin Valley. Use is made nearly every year during the early spring for a 1½ - 2 month period, following which the sheep are trailed north to summer ranges in the eastern foothills of the Sierra Nevada Range. This use of the desert is a vital link in the year-round operation of these sheep ranchers.

Cow/Calf-Steer Operations

The eastern San Bernardino County region is the locale of operations of this type. Grazing is administered under Section 15 regulations, with the operators having little or no ranch property. Cattle are grazed in the transition zone between the high and low desert on a year-long basis. Large areas are used, many of the leases covering 300,000 acres or more. Range use and control is based upon the ownership of livestock waters, and operators have drilled numerous wells with many miles of pipelines leading away from the wells to areas devoid of natural water supplies.

The operators have a cow/calf herd that is more or less stable and continuing and is based on the perennial forage supply of the range. In years of lush forage, large numbers of Mexican steers are purchased and grazed for as long as possible before being sold to feedlots.

Regular Cow/Calf Operations

Few in number, these operations are administered under Section 3 regulations. Use is made in the higher elevations of the high desert zone with a grazing season of eight months. Most are old-line cattle ranches that are relatively stable so far as desert operations go.

Livestock Problems

In the low desert zone, the major problem is an administrative one; the ability to process applications and authorize grazing rapidly enough to make efficient use of the short-lived vegetation. Other problems include the development of additional livestock water supplies, and administration of the recent increase in recreation use of the desert. Some complaints have been received from ranchers regarding camping near wells, springs, and other water sources used by livestock, tending to discourage the animals from drinking. Also, there has been some harassment of livestock by motorcycle and off-the-road vehicle users. Ranchers complain that weight losses occur when these animals are frightened and are run for considerable distances.

The problems in the high desert region are similar to those found on perennial ranges throughout the Great Basin. Perennial plants have been overgrazed and range condition has deteriorated and is considered still in a downward trend.

Other problems are the same as those mentioned about the low desert area: water development and administration of increased recreation use.

Livestock Management

Adjudication of grazing privileges has been completed on the area administered under Section 3 regulations. However, forage inventories need to be completed on roughly 50 percent of the area to adjust carrying capacities and stocking rates.

On Section 15 leased lands, management has consisted of issuing leases, settling disputes, and collecting rental fees. Recently, emphasis has been placed on management of the grazing resource on these lands, and efforts are being made to develop allotment management plans.

Development in the past has consisted primarily of obtaining adequate water distribution for livestock, and some fencing and miscellaneous-type projects have been completed. Future development will provide additional water, fencing, and perhaps brush conversion as more is learned about the desert environment.

Livestock Economics

In some areas of the desert, livestock grazing constitutes a major use of the public domain for a significant portion of the year. The livestock operations typically require large acreages of rangeland in order to have enough forage to maintain an economical unit, and many operations are marginal. In many areas, as has been pointed out, there are large fluctuations in forage supplies from year to year depending on climatic conditions. Average annual figures on the value of livestock grazing do not give an indication of this fluctuation.

The average forage figures quoted under Livestock Statistics are based on average years in which annual forage is present, and exclude poor years in which such forage is not available.

In some years, therefore, the value of livestock grazing may drop well below average figures,while in other years it can increase manifold as much as ten or more times its average value in some areas.

Average figures indicate that approximately 176,000 Animal Unit Months of forage are utilized by livestock each year on the Public Domain lands in the California Desert. According to a recent grazing fee study conducted by BLM and the Forest Service, an AUM of forage is valued at $3.25 as reflected in the local economy. Therefore, grazing has an average yearly local economic value of $572,000 in the desert region.

ARCHAEOLOGY

Pictographs throughout the desert bear mute testimony to the prehistoric people who lived there.

ARCHAEOLOGY

The scientific value of archaeological deposits rests upon a particular professional archaeologist's theoretical research interests in a particular site or in a group of sites (or region). The theoretical value of the professional may include such orientations as ecological adaptions of man to a natural environment, settlement patterns of human groups within an ecological or geographical zone or area, or the chronological placement of human groups in particular or general spatial locations. These variations, and others, in research orientation often cause different professionals to select quite different geographical areas as well as different types of archaeological remains for priority research. An example would be that one archaeologist who is interested in ancient man would select sites along ancient lake shores, whereas another archaeologist who is interested in the ecological adaptation of human groups to the environment would pick the "interphase" regions between the mountains and flatlands as priority research areas.

It was concluded that an archaeological site with recreational value would have to include the following characteristics: (1) be popular with the public with little, if any,preservation or interpretation, and (2) not require funds necessary to maintain an interpretive office or officer at the site. Example: A petroglyph site would need little preservation or explanation and not need the presence of an interpreter to expand on the value of the object, whereas an archaeological village site would need complete preservation and protection as well as interpretation for education and protective purposes.

There is some division between these two definitions of value. The recreational values of an archaeological feature seem to be of a permanent nature, such as a piece of rock art or a large ground figure. Although these have some scientific value, they are limited when compared with the village site. Of course, a reconstructed Indian Village site would have very high recreational value.

All of the following areas proposed as Recreation Lands have high archaeological potential:

Afton Canyon
Bighorn-Whitewater
Calico

Eastern Mojave
Redrock Canyon
Rodman Mountains

Chuckwalla
Fort Piute
Grapevine Canyon
Kingston Peak
Mecca Hills
Old Woman Mountains
Picacho
Imperial Sand Hills
Santa Rosa Mountains
Tufa (Trona) Pinnacles
Turtle Mountains (Mopah Peaks)
Whipple Mountains
Yuha Desert

These areas include geographic regions (Mountain to desert) which were favorable to prehistoric man within the greater California desert area. These regions are also important because they provide the variability of living areas (either permanent or seasonal) which are so important to the scientific understanding of prehistoric human adjustments to an environment on a yearly basis. All of these areas provide numerous archaeological sites which could be excavated, analyzed, restored, and preserved for recreational values. They also include such items as Indian trails, rock art and stone quarrys. An important feature of these areas is their relatively undisturbed state. The completely undisturbed archaeological site is of paramount importance to the professional archaeologist and would yield the greatest amount of valid data for potential recreational value.

1. Eastern Mojave Recreation Lands west and south, to include Bristol Mountain Chain.

This area has recently received considerable study by members of the staff of the San Diego Museum of Man. They report a quantity of completely undisturbed village and smaller sites, which if not protected, will be damaged and lost for their continuing research and subsequent recreational value.

2. Rodman Mountain Recreation Lands east, to include Lavic Lake Area.

This area has recently been found to hold very important sites which may show relationships between the mountain and lakeshore habitat. It is one of the few relatively undisturbed areas, with large numbers of known sites, that have this important ecological and geographic relationship.

3. Afton Canyon Recreation Lands, north, south, and east.

Important Indian site concentrations in these areas exist adjacent to the Mojave River Drainage. This is one of the few areas where Mojave River sites remain intact.

4. Yuha Desert Recreation Lands, north to include the general area of Halfhill Dry Lake, Fish Creek Wash, and Superstition hills to the U.S. Naval Gunnery Range.

The last remaining area of ancient Lake Cahuilla (Ooachuilla). This area is of high priority for studies of ancient man in North America.

Numerous sites are recorded along the ancient shore of this dry lake, but almost all have been destroyed completely by modern land development projects.

5. Chuckwalla Recreation Lands, north to include McCoy Mountains and east to McCoy Wash area.

This area contains important Indian camp sites and trails which have evidence of prehistoric contacts (such as trade) with the Indians who lived in what is presently Arizona, New Mexico, and adjacent states.

6. Calico Mountains Recreation Lands

Since 1964 excavations have been in progress at a site near Yermo in the Mojave desert. The site is situated on an old alluvial fan which has been subjected to considerable erosion. To date the excavation, which is 25 x 25 feet, has reached a depth of some 15 feet and has produced some 200 specimens which archaeologists have classified as being the result of human activity. These artifacts are principally side and end scrapers and simple bifacially worked tools. Though these artifacts have not been positively dated, they are estimated to be between 50,000 and 80,000 years of age. If such is the case, this site will establish the presence of early man on this continent tens of thousands of years earlier than heretofore estimated.

This dig has attracted international attention and is under the sponsorship of the San Bernardino County Museum, the National Geographic Society, and the Nature Conservancy. The principal consultant is Dr. Louis S. B. Leakey.

Important Deposits

The general consensus among professional archaeologists who are specialists in the area under consideration, is that all proposed areas of Recreation Lands include some of the most important archaeological deposits in southen California.

The archaeological and interpretive potential of archaeological sites is almost completely dependent upon preservation until scientific forces can be directed toward their investigation and interpretation. Archaeological sites, unlike geological materials, are unique; each from the other. Removing a single artifact from a site distorts the interpretive value.

Archaeological sites are irreplacable. Without preservation, research, and interpretation, subsequent recreational value is impossible.

All areas that are eventually set aside as recreation lands would require an extensive archaeological reconnaissance and inventory of sites and other archaeological data as a means toward complete protection.

ETHNOGRAPHY

Many different groups of Indians have lived in the California Desert. This Indian site is in the Santa Rosa Mountains.

ETHNOGRAPHY

The scientific and humanistic understanding of the Indian cultures will be of value to all Americans of the future. The understanding of how man's social and cultural responses to change have made it possible for him to adjust, or fail to adjust, will aid him in making decisions that will unite rather than divide mankind along biological and cultural lines.

In other words, one of the main interpretive values of this kind of information is that it tends to emphasize the unity of human responses to life rather than the diversity which tends to fracture cultural cooperation and growth.

The Indians that inhabited southern California were either of the Shoshonean or Yuman linguistic stock. Map 2 indicates the approximate location of the Indian groups associated with these two linguistic stocks.

Shoshonean

The Shoshonean area in California was a small fraction of the territory occupied by the entire linguistic stock. The Shoshonean had four linguistic branches -- Plataeu, Kern River, Southern California, and Pueblo. All except the Pueblo were represented in California. Within the Plateau branch, the Shoshoni-Comanche and Ute-Chemehuevi linguistic divisions were represented in the study area. The Tubatulabal, the only group in the Kern River branch lived adjacent to the study area. The Southern California branch was represented by the Serrano and Luiseno-Cahuilla linguistic divisions in the study area.

The California Shoshonean languages were so specialized that a conservative estimate of their antiquity in California would indicate that they were here for at least 2000 years before the time of European contact (mid 1500's). Indian groups associated with these linguistic divisions that lived in or adjacent to the study area are as follows:

The Koso (Panamint)

The Koso Indians are the most westward segment of the Shoshoni-Comanche linguistic division.

Their territory was large and thinly populated. Exact boundaries are not known, however, the crest of the Sierra to the west has been assumed as the boundary between the Koso and the Tubatulabal, their western neighbors. On the north were the Eastern Mono of Owens River. The other borders indicated on Map 2 are approximate and undoubtedly very permeable. Aboriginally, the Koso were known to have inhabited the Coso, Argus, Panamint, and Funeral Mountains and the intervening Coso, Panamint, and Death Valleys. At the turn of the century they actually lived at four spots in this area -- Cottonwood Creek, in the northwest arm of Death Valley; south of Bennett Mills on the eastern side of the Panamint Mountains; near Hot Springs, at the mouth of Hall Creek into Panamint Valley; and northwest from these locations, on the west side of Saline Valley, near Hunter Creek at the foot of the Inyo Mountains.

In 1891, less than 100 Koso were living and by 1923 the Koso were not sufficiently differentiated from adjoining groups to estimate their number.

The Chemehuevi

The Chemehuevi and the following Kawaiisu were of the Ute-Chemehuevi linguistic division. They and the non-California based southern or true Paiute and Ute all spoke dialects of remarkable uniformity and most experts believe that the bands of Chemehuevi were nothing but Southern Paiutes. "Chemehuevi" is the generic name for Southern Paiute and is a Mojave word. The term has remained merely to distinguish the Southern Paiutes of Nevada from those in California.

The Chemehuevi are one of the few California groups to have partly altered their location in the historic period without pressure from the white man. About 1776, the Yuma and Mojave pushed the Halchidhoma (and Kohuans) eastward and the Chemehuevi allied themselves with the victors. Thus, when the Americans came, they found Chemehuevi on Cottonwood Island (Colorado River), as well as in the valley that bears their name, and on both sides of the Colorado River. The movement of Chemehuevi bands as a consequence of Yuman speaking peoples' warfaring greatly influenced their dispersion in historic times. After 1867, a band of Chemehuevi was found as far away as Twentynine Palms. The following villages were recorded for the Chemehuevi in the early 1900's:

Village	Location
Mokwats	Kingston Mountains
Yagats	Armagosa
Hokwaits	Ivanpah Valley
Timpashauwagtsits	Providence Mountains
Moviats	Cottonwood Island
Shivaiach	Chemehuevi Valley

Other villages were located farther west and south but their names and locations were never recorded.

Even though the Chemehuevi area is the largest in California occupied by a people of uniform dialect, their population probably never exceeded 1000 persons and probably less than 260 existed in the early 1900's.

The Kawaiisu

The Kawaiisu were an offshoot of the Chemehuevi and settled in the Tehachapi Mountains. Due to this radical change in environment, the Kawaiisu became much more similar to the western people than their nearest language-kin to the east.

The Kawaiisu inhabited the Tehachapi Pass, Walker Basin, and possibly, some of the effluents of the Kern River. Their ownership on the eastward, drier slopes of the Tehachapi Mountains and the desert area is conjectural.

The aboriginal population may have been 500.

The Tubatulabal

The Tubatulabal were of a distinct Shoshonean linguistic branch. They lived in the upper drainages of the Kern River--adjacent to the western limits of the study area. Their environment, too, partly accounts for this distinction from their neighbors, the Koso and Kawaiisu Indians. The aboriginal population may have been 1000.

The Vanyume

The Serrano linguistic division was represented by the Vanyume and Serrano (proper) Indians in the study area.

The Vanyume are the Serrano of the Mojave River. Except for a few individuals merged among other groups, the Vanyume are extinct. The limits of their territory are vaguely known.

The Serrano Proper ("Mountaineers")

The Serranos' aboriginal range extended along the San Bernardino Range and an unknown area extending northward. In the east, it was desert; to the west, it was a region of timbered valleys between rugged mountains. They also occupied the San Bernardino Valley close to Riverside.

Their aboriginal population must have been about 1500. In the census of 1910, there were a little over a hundred. Later statistics seem to have completely lumped the Serrano with the Cahuilla, as the former are not mentioned. Thus, they may be extinct.

The Luiseno

The Luiseno and the following Cahuillas were of the Luiseno-Cahuilla linguistic division. The Luiseno, named after the Mission San Luis Rey de Francia, occupied a somewhat irregular territory that extends south from Mount San Jacinto--adjacent to the study area. To the north they had the Serrano as neighbors; to the east Cahuilla, and to the south the alien (Yuman speaking) Diegueno.

The Luiseno were a hill rather than a mountain people and seldom reached the summit of the watershed.

Linguistically, there are slight dialectic differences within the Luiseno range, especially between the extreme north and south, but on the whole the speech is remarkably uniform for so considerable an area.

Pass Cahuilla

Palm Springs Canyon was the focal point of this group, and their boundary runs northward or northeastward from Mount San Jacinto. White Water probably marked their limit against the Serrano.

Pass Cahuilla clans, however, seemed to have lived in comparative isolation and not in villages composed of several clans, as did the Desert Cahuilla.

By 1920, the remnants of the Pass Cahuilla people lived on the Moronga Indian reservation near Banning.

Desert Cahuilla

Southeastward from the territory of the Pass Cahuilla, partly below sea level, lies the territory of the Desert Cahuilla. The southern end of this arid valley, occasionally watered by overflow from the Colorado River, was in the possession of the Yuman speaking Kamia. The northern end, down to about Salton Sea, was inhabited by the Desert Cahuilla.

The Desert Cahuilla probably moved from the more hospitable mountainous region although groups may have been scattered along the edge of the desert and west into the Santa Rosa and San Jacinto Mountains as well as the eastern edge of the desert at the base of the Little San Bernardino Mountains. It is also possible that the movement to mountain edges was caused by the occasional flooding of the desert by the Colorado River and when the flood receded, they would return to the desert areas.

There were 16 Desert Cahuilla villages prior to the settlement of Mormons in San Bernardino around 1851.

Mountain Cahuilla

These people lived in the watered canyons south of San Jacinto Peak overlooking the inland desert. Their range above sea level was between 3000 and 4000 feet. Two main groupings were located at Los Coyotes in Coyote Canyon (Santa Rosa Mountains) and the other at Santa Rosa in what is called the Cahuilla Indian Reservation. Old Santa Rosa, located at a fork of Rock House Canyon, was important as a town in about 1875. The ten known clans of the Mountain Cahuilla were influenced by the Spanish mission system to the west, whereas the Cahuilla neighbors to the north and east were relatively untouched. Aboriginal Mountain Cahuilla culture was one of the first to change, making it difficult to study their native way of life.

Yuman

The Yuman linguistic stock of the Hokan language family is represented by the following divisions: the Lower California, the Central, and the Arizona Plateau. The southern California Yuman speakers considered in this report all fall within the Central division, centering on the Lower Colorado River and including the Diegueno (Southern and Northern), the Kamia, the Yuma, the Halchidhoma (and Kohuana), and the Mojave. Although these groups are represented within California, culturally they are more closely associated with non-California Indians in Mexico and Arizona.

The Diegueno (Southern and Northern)

Diegueno territory was bordered on the west by the Pacific Ocean and by the holdings of the Luiseno, Cupeno, and Cahuilla on the north. For the east and south no precise boundary can be set. Although different dialects were spoken between the Northern and Southern Diegueno, there is little known about how culturally separate they really were. The southern territory included such place names as Campo, La Posta, Manzanita, Guyapipe, and La Laguna. Evidence suggests that the Southern Diegueno were primarily located in Mexico. Their southern range is unknown.

The Diegueno population, with Kamia of American California included, may have reached 3000 in prehistoric times; however, in the 1920's this population numbered between 700 and 800. The Diegueno Indians had a higher rate of survival than any other mission influenced group in California. This was in part due to the Mission San Diego's restricted range of influence and to the aggressive nature of the Dieguenos.

The Kamia

As stated in Kroeber's monumental work on the California Indians (1929; revised 1955), it is unknown what group owned the desert to the east of the Diegueno, from Salton Sea to the now fertile Imperial Valley. This area has been tentatively assigned to the Kamia. However, the definition of "Kamia" is questionable as is indicated by Kroeber's statement that the ". . .southern Diegueno sometimes call themselves Kamiai or Kamiyahi, which once more intrudes the vexing question of who the Kamia were."

The Yuma

The Yuma Indians were the most numerous of the Yuman stock in California and were contacted in 1540 by Spaniards exploring northward from Mexico.

Their territory was centered about the mouth of the Gila River. They are reported to have occupied the main stream for 15 miles above and 60 miles below the confluence of the Gila and the Colorado Rivers.

In former times the tribe consisted of three local divisions, an eastern, a northern, and a southern. Each division is said to have spoken a slightly different dialect, although at present Yuman is the single, undifferentiated language with mere traces of a southern dialect remaining. In 1946, Yuman was spoken by approximately 750 members of the Yuman tribe living on the Fort Yuma Indian Reservation in California.

The Halchidhoma (and the Kohuana)

Prior to 1776 these Yuman speaking people lived along the Colorado River at Parker, almost halfway between the Mojave to the north and the Yuma to the south. But the Mojave later drove the Halchidhoma and the Kohuana south from Parker toward the Yuma. Eventually, the Mojave pushed them to the east and they merged with the "East Pima" or Maricopa Indians of Arizona. The Kohuana abandoned their alliance with the Yuma and allied with the Maricopa at Maricopa Wells.

In 1776 there were reported to have been 3000 Kohauna living on the east side of the Colorado, whereas the Halchidhoma were reported to have numbered 2500. When the Americans came in 1850, these groups were merged among the Maricopa, and of the seven or eight related but warring Yuman nations that once lived on the banks of the Colorado, there remained only three: the Cocopa, Yuma, and Mojave and a fragment of a fourth, the Kamia.

The Mojave

The country of the Mojave is the valley which bears their name and lies in what is now three States -- California, Nevada, and Arizona. As the channel of the Colorado River has flowed in recent years, most of the bottom lands lie on the eastern side, and it is there that the bulk of the Mojave settlements were located.

The Mojave were one of the few people in California who thought of themselves as a national entity, the Hamakhave -- although their settlements were small, scattered, and perhaps occupied only for short times.

In 1770 there were about 3000 Mojave. By 1910 this number was reduced to about 1050.

Recreation Lands

The proposed Recreation Land areas were, for the most part, the same as those lands which were occupied by the Indians. Historically, it would be possible to locate most of the villages of these people. Prehistorically, we would have to assume all areas as having at sometime been used.

Preservation, in any of its many forms, is the only means of preventing loss of important information. Cultural process is non-repeatable. The fact that past events are "frozen" in the archaeological record should only be thought of as preservation in its weakest sense. Preservation of dynamic human events (i.e., process) is unlike any other kind of preservation because it cannot isolate phenomena. It can only record events through time. This is a concept that is characteristically anthropological and not historical.

It is even more crucial now to preserve contemporary Indian culture as it was to record it 100 years ago.

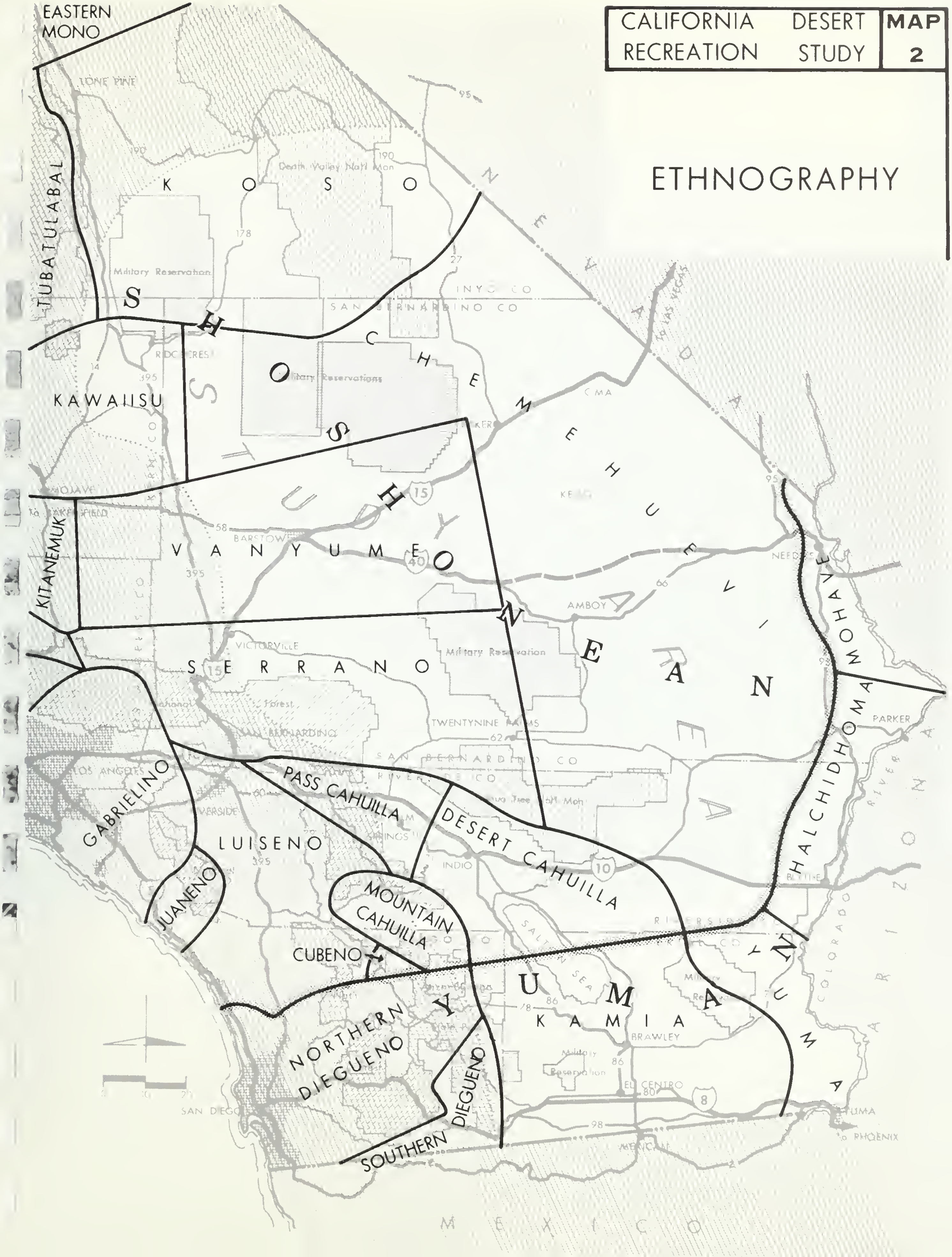
The history of public and governmental interests in the California Indians is probably as poor as in any other region of the United States. Although contemporary public opinion often suggests the contrary, the California Indians' success was much greater in terms of contact and competition with the Spanish than with Anglo-Americans.

Both branches of the white race arrived on the Pacific Coast with a heritage of long experience with the Indians; both had developed a well-formulated mental attitude and a definite policy with respect to the natives. But these attitudes and policies were conditioned by the widely differing pioneering and colonial experience of the two branches in the preceding centuries. Both Anglo-Saxons and Spanish had pursued exploitation of New World resources. The Spanish, however, had systematically availed themselves of human resources, whereas the English had tapped only material wealth. That is to say that the aboriginal race was an economic asset to the Spanish and as such was to be conserved. The Anglo-American system, on the other hand, had no place for the Indian.

CALIFORNIA DESERT RECREATION STUDY

MAP 2

ETHNOGRAPHY


EASTERN MONO
TUBATULABAL
KOSO
KAWAIISU
SHOSHONEAN
CHEMEHUEVI
VANYUME
KITANEMUK
SERRANO
GABRIELINO
LUISENO
JUANENO
PASS CAHUILLA
DESERT CAHUILLA
MOUNTAIN CAHUILLA
CUBENO
YUMAN
NORTHERN DIEGUENO
SOUTHERN DIEGUENO
KAMIA
MOHAVE
HALCHIDHOMA
YUMA
NEVADA
ARIZONA
MEXICO
LONE PINE
Death Valley Nat'l Mon
Military Reservation
Military Reservations
INYO CO
SAN BERNARDINO CO
RIVERSIDE CO
RIDGECREST
MOJAVE
to BAKERSFIELD
BARSTOW
BAKER
KELSO
NEEDLES
AMBOY
VICTORVILLE
TWENTYNINE PALMS
Joshua Tree Nat'l Mon
LOS ANGELES
RIVERSIDE
INDIO
BLYTHE
PARKER
BRAWLEY
EL CENTRO
SAN DIEGO
YUMA
to PHOENIX
to LAS VEGAS
COLORADO RIVER
SALTON SEA
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HISTORY

A picture of western expansion is reflected by the walls of historic Way Stations in the California Desert. This is Fort Piute.

HISTORY

Until the coming of the railroad and the automobile to the southern California deserts, the rugged mountains and the barren wastes of this immense region were obstacles in the path of people seeking a promised land. Thus the earliest history of the area is largely a chronicle of explorers and pioneers seeking and establishing routes of travel through the difficult land. Few chose to remain east of the coastal ranges.

Then, as the Argonauts pushed toward the California gold fields and later, as disappointed miners fanned out from the Mother Lode in search of richer pickings, people discovered that the southern California deserts held mineral wealth. Prospectors swarmed over the area, and miners and mining camps were established to extract the precious ores. Gold was the principal lure, but as the nation became more industrialized the base minerals -- borax, talc, and many others-- inspired the greater activity. Towns, transportation stations, and industrial plants flourished and then were deserted as lodes were exhausted or mining interests shifted.

Since the turn of the present century the introduction of large-scale irrigation has changed the appearance and the economy of much of the desert. Populous centers have grown up where water could be made available, and the more rugged and arid regions have become favorite recreation areas for the residents of both desert and coastal cities.

The shells and ruins of once-flourishing towns, mines, and way stations are now prime resources for increased enjoyment and understanding of the southern California deserts. Although many of the most important historical sites are now in heavily populated areas or in private hands, many others are publicly owned and are available to visitors. An attempt is made here to indicate the main emigrant routes and the gold mines and camps that were important in the early history of California and that can serve to enhance a desert experience.

Although he was not the first white man to cross the Colorado River, Captain Juan Bautista de Anza was the first man to lead an expedition expressly for the purpose of blazing a trail through the California desert to the coast. Accompanying him was Father Francisco Garces.

De Anza and Garces reached the junction of the Gila and Colorado Rivers on February 7, 1774, and two days later camped on the California side at the ford above the Gila. They followed the river past Pilot Knob and camped at the place where the Mission San Pedro y San Pablo was established in 1780. This was near Yuma just above the boundary line, and from here the expedition continued southwest until it reached a lake that Anza called Laguna de Santa Olaya, 12 miles south of the boundary and 8 miles west of the Colorado. The party re-entered California on March 7, 3 or 4 miles southwest of the Yuha Well, then proceeded to the junction of the San Felipe and Carrizo Creeks. This place is now known as Harper's Well, about 10 miles west of the southern end of the Salton Sea. The expedition entered the mountains by way of San Felipe Canyon and San Carlos Pass.

De Anza then entered what is presently San Diego County via San Felipe Creek. He camped at San Gregorio (at the entrance to Borrego Valley), then at Santa Catarina in Coyote Canyon at Reed's Springs (or Lower Willows), just above Beatty's Ranch. The next day his party entered Riverside County.

The party passed about 8 miles southeast of the little town of Anza, then through Cahuilla Valley to Dry Lake. It proceeded to the head of Bautista Canyon, descended the canyon to the San Jacinto River, camped at the western edge of Jacinto Lake, proceeded through Allessandro Valley, and descended by way of Sycamore Canyon. The party then crossed the present site of Riverside and proceeded northwest to San Gabriel and Monterey.

Anza's expedition had proved successful, so that upon his return to Mexico plans were immediately begun for transporting settlers to California via the land route. In 1776, Anza again led an expedition through the desert, using pretty much the same trail as before, with the following variations: In present day San Diego County he marched through the little pass called Los Puertecitos, then camped at San Gregorio. The party also camped at El Vado and at Santa Catarina. In Riverside County Anza made one variation from his previous route. After leaving Lake San Jacinto the company went through Bernasconi Pass and across Alessandro Valley by way of March Field to the old campsite on the Santa Ana River.

Another trail was blazed by Pedro Fages in 1781 and 1782. The route he followed eventually became known as the Old Emigrant Trail. It followed Anza's trail to the San Felipe watering place, then turned up Carrizo Creek to the southwest. It then went by way of Vallecito, over the Cuyamaca Mountains to Warner's Ranch and then to San Diego Mission.

Jedediah Strong Smith was the first American pathfinder to enter California overland. In 1826 he set out from Salt Lake City and passed along the east side of the Sevier River. He then turned southwestward into a mountain range, south again across the Beaver River to the lower course of the Virgin River. He proceeded down the river to the Colorado, crossed the latter to the Mojave Indian villages around Needles and then went across the desert and up the Mojave River to its western headwaters in the San Bernardino Mountains. Crossing the range eight miles east of the Cajon Pass, Smith came down into the San Bernardino Valley on the ridge between Devil and Cable Canyons, crossing Cajon Creek between Devore and Verdemont. From here he skirted the base of the foothills to Cucamonga, to San Gabriel and the sea. This was the Mojave Indian Trail. It is important because it antedates the Cajon Pass route.

Another major trail into California was the old Spanish Trail, opened by William Wolfskill in 1831. Although a few others had passed this way before, Wolfskill's route was the one most frequently used. The Spanish Trail began in Santa Fe and ended in Los Angeles. From Santa Fe it swung north into Utah, its most northern point being the town of Castle Dale. From there it went in a southwesterly direction, crossing Nevada near Bunkerville and going by way of Las Vegas. The trail came into California near Resting Springs in Inyo County, then went by Salt Springs, Bitter Springs, Barstow, Victorville, over the Cajon Pass, skirted the east side of the San Gabriel Mountains (like the present highway) to San Bernardino, then to San Gabriel and Los Angeles. The route between the Cajon summit and San Gabriel was that followed by the Mojave Indian Trail as well.

Caravans from Santa Fe often used this trail as did many Morman emigrants. Hence it was also known as the Santa Fe Trail and the Morman Trail.

As more settlers crossed the desert the need for protection from hostile Indians became apparent. Along the Mojave Indian Trail the government established several forts between Fort Mojave and San Bernardino. This stretch of road thus came to be called the Old Government Road, and went from Fort Mojave to Piute Springs, Rock Springs, Government Holes, Marl Springs, 17 Mile Point, Fort Soda, the Caves (Afton Canyon), Camp Cady, present day Daggett and Barstow, and on to Nelendals, Point of Rocks, Victorville, Cajon Pass, Canyon House, Martins, and San Bernardino.

One of the forts along this road was Fort Piute, established in the early 1860's about 25 miles west of Fort Mojave. It was actually an outpost of Camp Cady, rather than a complete military establishment. Outposts were established on the Old Government Road to provide relief for the soldiers and their mounts while on patrol. Behind the fort is a ravine where the ruins of the stockade may still be seen. Some of the old rock walls also remain, open to preservation and interpretation.

Before the building of the railroads one of the most serious problems faced by Californians was the lack of a system of communications with the rest of the continent. To fill this void, the Butterfield Overland Mail Company began running stages between St. Louis and San Francisco in 1858. A southern route was chosen, partly for political reasons, partly because the route was open all year round.

After crossing the California border at Yuma, the Butterfield stages went by way stations at Pilot Knob, Cooke's Wells, Gardener's Wells, Alamo Mocho (the last three were located in Mexico), Calexico, Indian Wells, Hall's Wells, Carrizo Creek, Palm Springs, Vallecito, San Felipe, and Warner's Ranch. From Warner's Ranch the stages continued north to San Francisco.

Another stage route was established between 1863 and 1877. This was the Bradshaw route which ran between San Bernardino and La Paz on the Colorado River. The route went by way of Ehrenberg, Chuckwalla Well, the Coachella Valley, Palm Springs, and Beaumont.

On July 1, 1866, Congress granted extensive areas of public lands to two railroad companies for construction, operation, and maintenance of the transcontinental railroad system. Union Pacific and Central Pacific (parent of today's Southern Pacific Company) were granted the alternate odd numbered sections to a depth of 10 miles on either side of the line, plus additional lands for stations, shops, and other uses. Altogether in the United States, a total of more than 20 million acres was granted under this act, portions of it in the California Desert. This accounts for the characteristic checkerboard pattern of land ownership in many areas, and although the railroad companies sold off some of the granted lands, today the Southern Pacific Company is one of the largest private landowners in the California Desert region.

Mining in California was not confined solely to the gold country of the Mother Lode. "Desert Rats" prospected the eastern Mojave desert and mountains not only for gold and silver but for other kinds of minerals as well.

There are remains of at least a dozen mining towns in Death Valley, even more in Panamint Valley. One such town was Panamint City. In 1860-61 prospectors discovered gold and silver in Surprise Canyon in the Panamints. Hostile Indians and steep canyons prevented further exploration until 1872, when three prospectors discovered ore of silver and copper value. These men soon organized the Panamint Mining District. During the winter of 1874-75 Panamint City reached its peak. It had a population of 5,000 and included the usual assortment of saloons, houses, and stores. Thousands of dollars worth of ore were shipped out of such mines as the Wonder, Hemlock, and Wyoming.

However, Panamint suffered the fate of many another mining town. As soon as the ore supply was exhausted the miners left. In 1876 a flood washed away much of the town and today only a few ruined stone walls and the foundations of a mill remain.

Another mining town of the Mojave Desert was Calico, in the Calico Mountains, where silver deposits were discovered in 1881. The mines, including the Silver King and Waterloo, shipped $65 million of silver from the district. Borax was also discovered near the town, as were lead and copper. Borax was also found in Death Valley, and the borax industry continues to this day.

Calico reached its height in 1886, but by 1892 the richest veins were exhausted and five years later the camp was deserted. Structures made of adobe have endured to the present; the rest of the town has been restored.

Still another town was Picacho, 25 miles north of Yuma. It was first located by Mexican prospectors in 1862 and thus retained a Latin flavor throughout its existence. Rich lodes were found nearby so that payrolls averaged $40,000 per month. The Picacho and the Golden Dream were only two of the mines in the area. All but a few of Picacho's buildings vanished, but the townsite is now being developed as a state park and recreation area.

Another mining district existed at Tumco, five miles north of Ogilby Station on the Southern Pacific. Only ruined walls and foundations remain of a city which once boasted a population of 2,000. The Tumco mines operated from 1884 to 1914. The most famous of them were the Golden Queen, Golden Cross, and Golden Crown. Five miles northeast of Ogilby was the American Girl mine. Near the San Bernardino-Kern county line the remains of the towns of Atolia and Red Mountain mark the Rand Mining District.

The history of gold and silver mining towns is the same in the desert as in the Mother Lode: A town grew until the strikes were exhausted, then declined and finally vanished. Today other minerals, such as borax, are mined more extensively in the desert than either gold or silver.

More recent history in the desert is primarily concerned with the effort to bring water to this area. The successes are evident today in the Imperial Valley where Colorado River water has created a lush agricultural district. In this process, one event made a dramatic impact on the desert landscape, and is an interesting historical note.

By about 1902, the canals carrying water from the Colorado River to Imperial Valley began to silt full. This interfered with the delivery of water. When engineers began opening levees to divert the water to new channels, insufficient controls were used and this, coupled with a series of spring storms, caused complete loss of control of the diverted water. By 1906, a full 40 percent of the river's flow was by-passing the irrigated fields through the new channel it had cut (New River) and emptying into the dry bed of ancient Lake Cahuilla, now known as the Salton Sea.

Though the depth of the Sea has decreased more than 40 feet from its 1907 maximum, it now supports an important sport fishery activity, together with boating, water skiing, and other water-based recreation. In 1963, the Sea provided an estimated 325,000 angler-days of fishing. By 1980, it is estimated that this use will increase to one million angler-days. (Figures from California Department of Fish and Game).

The study area still has visible remnants of its history, for although men did not easily settle the desert they left traces of their passage. These remnants, usually in the form of ruins or sites, indicate the kind of history which occurred there. The preservation of these areas would make it possible to present history in a visual, lively manner instead of relying solely on the written word.

The ruins of such way stations as Pilot Knob, for instance, can still be seen. The possibility exists of restoring it to allow for visitor inspection.

Or, the visitor could follow an old trail, stopping at the campsites of early explorers. Parts of the old roads can still be identified, as can old campsites.

The opportunity to see the old saloons, stores, shacks, and homes would clearly convey a picture of life in a mining town. Moreover, with the use of old mining equipment a mining scene could be authentically recreated. Probably many persons today have no idea of how the frontier miners worked.

Among other sites of historical significance which might have recreational value are old railroad towns, such as Kelso; the remains of an old plank road, one of the first auto roads in the desert; the remains of the Fort Yuma buildings; the site of three ferry crossings of the Colorado River; and the site of Camp Salvation, a refugee center for emigrants going to the gold fields over the southern route.

An historic site not only provides the historian with visible information of years past; it can provide an enlightening and entertaining experience for the visitor by giving him glimpses of a style of life different from his own.

Part II

THE CALIFORNIA DESERT RESOURCE

SECTION C

RECREATIONAL USE OF THE DESERT

Summary of Recreational Use Data

Data on Areas Selected for Visitor Use Survey

Economic Impact of Recreational Use

Future Trends in Recreational Use

Part II

The California Desert Resource

Section C

Recreational Use of the Desert

Generations of Americans have found outdoor recreation opportunities in the California Desert. However, it has only been in recent years that the desert has received widespread uses.

Hundreds of thousands of southern Californians experienced their first recreational use of the desert this past year. These first time users coupled with many repeat visitors made it mandatory that the Bureau of Land Management investigate and analyze the increasing recreational use of the desert.

This section of the study examines the recreational use, its economic impact and future trends.

SUMMARY OF RECREATIONAL USE DATA

The outdoor recreation activities that California residents and their visitors participate in while roaming the California desert are many and diverse--camping, sightseeing, and rockhounding are some of the more common pursuits, while dune buggy travel, cycle scrambles, and chariot sailing are a few of the more exotic forms.

From field survey information and accumulated recreation statistics, it was determined that California residents and their visitors spent an estimated 4.9 million visitor days on Public Domain land in the desert areas of southeastern California during fiscal year 1968.

Survey data indicates that 39 percent of the visitors used their family sedan or station wagon while 51 percent came in a pickup or pickup-camper combination. Eight percent of the visitors arrived in their four-wheel drive vehicles. Survey data does not include organized groups such as motorcycle clubs, school field trips, etc.

Of the various age groups using the desert, the teenagers comprise 13 percent while the younger children make up 24 percent. In talking with the adult members of families using the desert, it was found that younger children travel more with their parents than the teenage group, thus substantiating the above figures. Recreation use of the desert by adults was in the majority, with 63 percent of the total visits.

Of visits to the desert public lands, weekend-overnight trips made up 58 percent of the totals. It is interesting to note that 46 percent of the visitors traveled over 150 miles from home to get to their destination in the desert. Fourteen percent of the visitors spent 4 hours or less in the desert while 59 percent stayed 2 days or more. The long travel distances probably account for the extended stays in the desert.

Of the frequency of visits to the desert areas, approximately 24 percent of the visitors are there for the first time, while 28 percent visit the desert at least 2 or 3 times a year.

Recreation activities that people participate in on public lands vary widely. While camping and sightseeing account for 50 percent of the visitor use, hiking, rockhounding, and motorcycling get their share with 13, 12, and 9 percent respectively. The motorcycle use is exclusive of all sanctioned motorcycle races on public lands, which alone accounts for 375,000 to 450,000 visits a year.

The most important activity in the desert is camping--or just getting out of the populated metropolitan areas of southern California. Dune buggy travel is 9 percent and could undoubtedly climb higher as more people become acquainted with the sport.

Hunting or target plinking accounts for only 3 percent of the visits. The reason for this rather low figure is because the field survey was conducted during the spring of the year and did not coincide with major hunting seasons. Therefore, hunting use does not reflect the number of sportsmen that travel to the desert area in pursuit of their favorite game animal or bird. It is quite possible that a detailed inventory of hunting use could add 800,000 visitor days annually to the total recreation use of the desert.

Of the people coming to a recreation site or area in the desert, 79 percent had decided on this spot as their main destination while 15 percent said it was an equal destination in their travels. Only 2 percent said this was not their main, equal, or secondary destination.

Summary of Recreation Use Data

A. Introduction

1. The following figures concern recreation interviews conducted on public domain lands in the southern California desert areas. There were 12 primary recreation area interviews and one general overall desert interview.
2. All calculations are based on recreation visits to BLM lands only.

B. Interview and Observation Results

1. Vehicles	Total Number	% of Total
Sedans	113	39
Pickup-Camper	151	51
*Motorcycles	120	
4-wheel drive	24	8
*Trailers	42	
Motor-Homes	6	2
*Dune Buggies	49	

2. Number of People

$$\frac{1{,}032 \text{ persons}}{294 \text{ vehicles}} = 3.5 \text{ persons/vehicle}$$

3. Ages of Visitors		
Up to 12	252	24
13 to 19	139	13
20 and over	641	63

4. Kind of Visit		
Wintering	6	4
Vacation	5	3
Weekend - 0 - night	106	58
Day use	64	35

*Associated with one of the other vehicles

	Total Number	% of Total
5. Distance to Home		
Within 50	18	10
50 - 100	20	11
100 - 150	60	33
Over 150	83	46
6. Miles Traveled Today		
0	71	39
Within 50	13	8
50 - 100	24	13
100 - 150	31	17
Over 150	42	23
7. Length of Stay		
Up to 4 hours	25	14
4 - 8 hours	22	12
1 day	28	15
2 days	66	37
Over 2 days	40	22
8. Frequency of Visit		
1 per week	10	6
2 per month	24	13
1 per month	29	16
2-3 per year	51	28
1 per year	23	13
First Time	44	24
9. Activities Participated in		
Dune Buggy Travel	19	5
Sightseeing	96	25
Picnicking	36	9
Camping	96	25
Hiking	52	13
Hunting	8	2
Rockhounding	46	12
Motorcycling	34	9
Fishing from canal bank	2	0
Painting	1	0
Hunting Snakes	1	0
10. Most Important Activity		
Picnicking	9	5
Sightseeing	47	26
Camping	50	28
Hiking	9	5
Hunting	5	3
Rockhounding	26	14
Motorcycling	18	10
Dune Buggy Travel	17	9
11. Rating of Site as Destination		
Main Destination	142	79
Equal Destination	28	15
Secondary Destination	8	4
Not Destination	3	2

This scene represents a major reason why people travel to the desert areas of southern California. While everyone does not isolate himself from his neighbor--he knows he can if he so desires.

The experience this child is having in the California Desert typifies the complete change of environment of a majority of recreation users who travel from adjacent large metropolitan areas.

DATA ON AREAS SELECTED FOR VISITOR USE SURVEY

As part of the effort to gather visitor use estimates in the Study Area, twelve locations receiving consistent and repeated recreational use were selected for investigation along with five sites that receive general use. The areas selected for study covered a wide segment of the desert and a broad spectrum of its uses.

In order to develop estimates of recreational use for the Study Area within a pre-selected time limit, it was necessary to use the following formats:

For the twelve sites receiving consistent and repeated use:

1. A uniform field survey to acquire basic recreation information was conducted.
2. Aerial reconnaissance flights covering each area on both weekdays and weekends were flown.
3. Traffic count readings for both weekday and weekend use on most of the areas were recorded. Limited personnel and equipment precluded one hundred percent coverage of the Study Areas.
4. Ground observations were recorded and were quite valuable where traffic counter data was limited or nonexistent.
5. Existing data was analyzed relating to seasons and patterns of use.

For the five sites receiving occasional use:

1. A one-time field survey to acquire basic recreation information was conducted.
2. Aerial reconnaissance flights covering each area on both weekdays and weekends were flown.
3. Limited ground observations were recorded.
4. Existing data was analyzed.

These five sites formed a basis for use information estimates falling outside the major use areas.

REDROCK CANYON - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Redrock Canyon Area north of Mojave, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 24th of February, 24th of March, and the 13th of April, 1968.
3. Ground observations were made for the study area during the months of February, March, and April, 1968.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 28 vehicles were in the area. Multiplying the vehicle count by 3.0, the average number of people per vehicle in the area, we arrived at a total of 84 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 270 vehicles and 810 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 410 vehicles and 1,230 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of February, March, April, May, September, October, and November comprise the heavy use season in the Redrock Canyon Area. These months have an impact of approximately 11,500 vehicles and 34,500 people.
5. The months of January and December average three-fourths as many visitors per month as an average month during the heavy use season, resulting in 2,500 vehicles and 7,500 people.
6. Visitor use during a typical summer month is 25 percent of an average month during the heavy use season resulting in an estimated recreation impact of 1,200 vehicles and 3,600 people.

The total average annual recreation visitor use on the Public Domain lands in the Redrock Canyon Area is approximately 15,200 vehicles and 45,600 visitors.

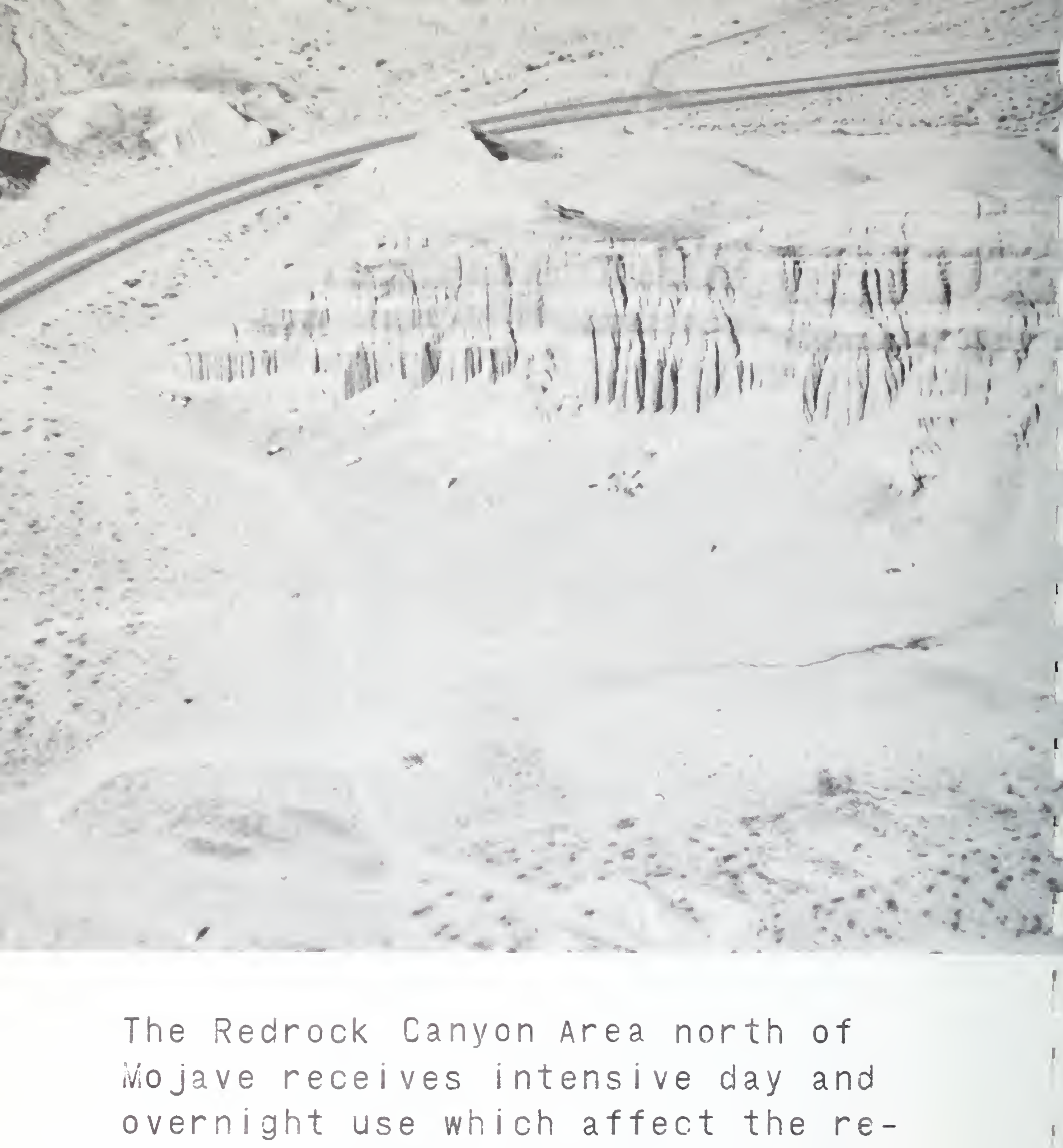
VISITOR USE SURVEY - REDROCK CANYON - NORTH OF MOJAVE

A. Interview and Observation Results

1. Vehicles	Total Number	% of Total
Sedans	11	25
Pickup-Camper	24	53
*Motorcycles	23	
4-wheel drive	5	11
*Trailers	3	
Motor-Home	5	11
*Dune Buggies	2	
2. Number of People		
137 persons 45 vehicles = 3.0 persons/vehicle		
3. Ages of Visitors		
Up to 12	33	24
13 to 19	25	18
20 or over	79	58
4. Kind of Visit		
Weekend - 0 - night	15	54
Day Use	13	46
5. Distance to Home		
Within 50	1	4
50 - 100	4	14
100 - 150	14	50
Over 150	9	32
6. Miles Traveled Today		
0	10	35
50 - 100	5	18
100 - 150	8	29
Over 150	5	18
7. Length of Stay		
Up to 4 hours	2	7
4 - 8 hours	5	18
1 day	1	4
2 days	13	46
Over 2 days	7	25
8. Frequency of Visit		
1 per week	4	14
2 per month	4	14
1 per month	8	29
2-3 per year	9	32
1 per year	1	4
First Time	2	7

*Associated with one of the other vehicles

	Total Number	% of Total
9. Activities Participated in		
Sightseeing	11	21
Picnicking	9	17
Camping	15	29
Hiking	4	8
Rockhounding	5	10
Motorcycling	8	15
10. Most Important Activity		
Rockhounding	2	7
Sightseeing	8	29
Camping	7	25
Hiking	4	14
Motorcycling	7	25
11. Rating of Site as Destination		
Main Destination	25	89
Equal Destination	2	7
Secondary Destination	1	4



The Redrock Canyon Area north of Mojave receives intensive day and overnight use which affect the remaining natural values.

This was the informal headquarters for an organized motorcycle club outing south of Redrock Canyon.

CALICO - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Calico Area near Barstow, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 7th, 10th, 11th, and 23rd of February, 24th of March, and the 12th and 13th of April, 1968.
3. Traffic count readings were recorded and ground observations were made for the study area.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season, it was determined that 53 vehicles were in the area. Multiplying the vehicle count by 3.9, the average number of people per vehicle in the area, gives a total of 207 people. This results in approximately 265 vehicles and 1,035 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season, it was determined that approximately 460 vehicles and 1,775 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 725 vehicles and 2800 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of February, March, April, October, and November comprise the heavy use season in the Calico Area. These months have an impact of approximately 14,500 vehicles and 56,000 people.
5. The months of January, May, and December average one half as many visitors per month as an average month during the heavy use season, resulting in 4,350 vehicles and 14,800 people.
6. Because of the drawing power of the old Calico Ghost Town and the summer vacation period, it is estimated that the summer months contribute 50 percent of the visitor use, resulting in approximately 18,850 vehicles and 73,500 people.

The total average annual recreation visitor use on the Public Domain lands in the Calico Recreation Area is approximately 37,000 vehicles and 147,000 visitors.

VISITOR USE SURVEY - CALICO AREA - BARSTOW

A. Introduction

1. All calculations are based on recreation visits to BLM lands only.

B. Interview and Observation Results

1. Vehicles	Total Number	% of Total
Sedans	13	62
Pickup-Camper	6	28
*Motorcycles	11	
4-wheel drive	2	10
*Trailers	5	

2. Number of People

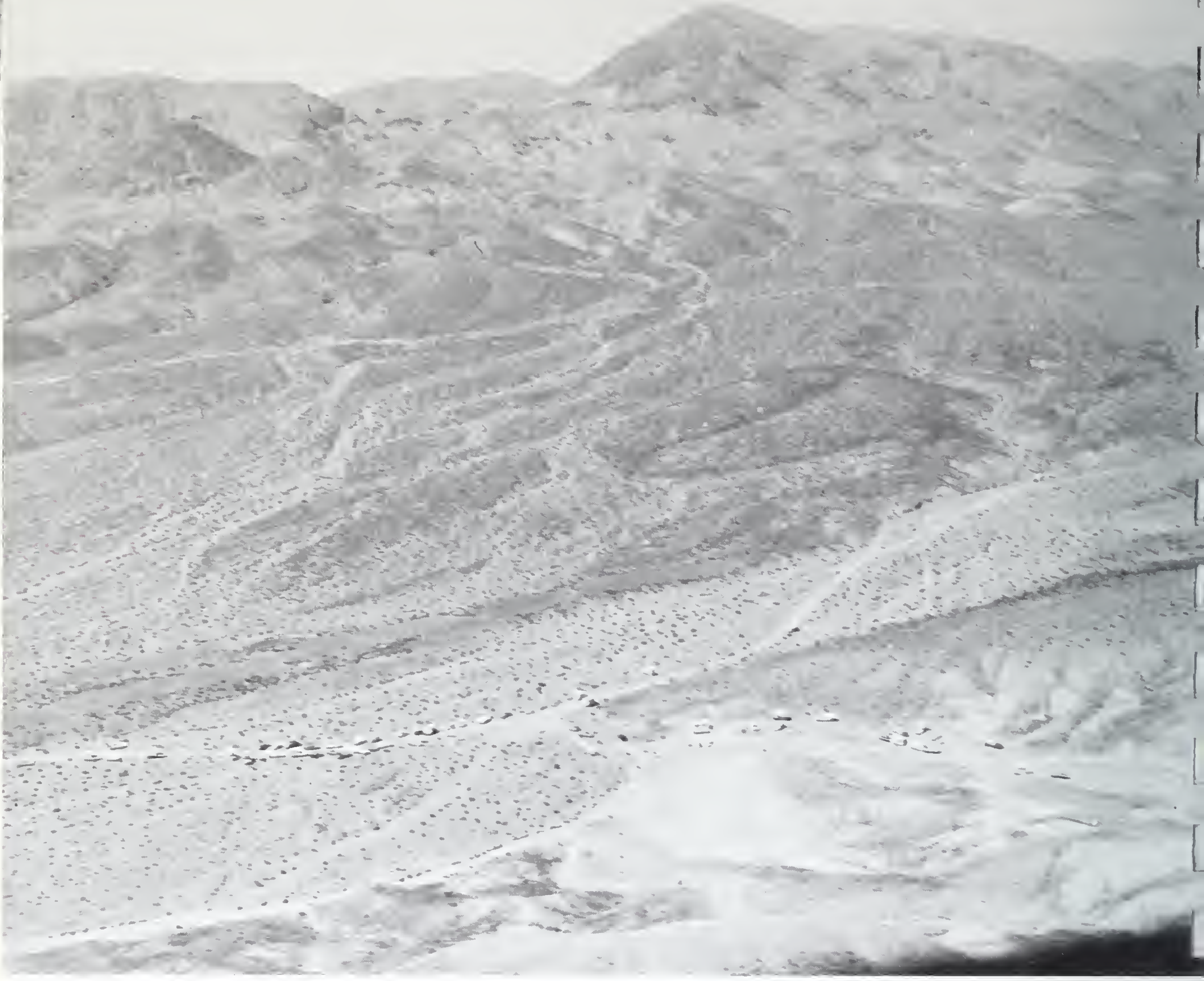
81 persons / 21 vehicles = 3.9 persons/vehicle

3. Ages of Visitors		
Up to 12	21	26
13 to 19	14	17
20 or over	46	57
4. Kind of Visit		
Weekend - 0 - night	10	71
Day Use	4	29
5. Distance to Home		
Within 50	0	0
50 - 100	3	22
100 - 150	10	71
Over 150	1	7
6. Miles Traveled Today		
0	7	50
Within 50	0	0
50 - 100	1	7
100 - 150	4	29
Over 150	2	14
7. Length of Stay		
Up to 4 hours	1	7
4 - 8 hours	1	7
1 day	2	14
2 days	9	65
Over 2 days	1	7
8. Frequency of Visit		
1 per week		
2 per month	5	36
1 per month	3	21
2-3 per year	3	21
1 per year	1	7
First Time	2	15

*Associated with one of the other vehicles

		Total Number	% of Total
9.	Activities Participated in		
	Sightseeing	9	20
	Picnicking	4	9
	Camping	11	25
	Hiking	13	30
	Hunting		
	Rockhounding	3	7
	Motorcycling	4	9
10.	Most Important Activity		
	Sightseeing	5	35
	Camping	9	65
11.	Rating of Site as Destination		
	Main Destination	13	93
	Equal Destination		
	Secondary Destination	1	7

This interesting stand of Joshua trees and yuccas near Barstow combines with wide open vistas to encourage use of the high desert.



This scene is not uncommon in the desert area near Barstow. Seventeen cars and station wagons, 30 pickup-campers, and three mobile homes plus numerous motorcycles were observed.

Where heavy visitation to the desert areas occurs, littering is a by-product. As funds become available areas like this are cleaned and kept clean so the visitor may have a better environment for his leisure travels.

In the Calico Area near Barstow, scouting groups such as this one are frequent visitors to the desert.

RODMAN MOUNTAINS - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Rodman Mountain Area near Barstow, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 7th, 10th, 11th, and 23rd of February, 24th of March, and the 12th and 13th of April, 1968.
3. Traffic count readings were recorded and ground observations were made for the study area.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 15 vehicles were in the area. Multiplying the vehicle count by 3.8, the average number of people per vehicle in the area, gives a total of 57 people. This results in approximately 75 vehicles and 285 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 185 vehicles and 700 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 260 vehicles and 1,000 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of February, March, April, May, October, and November comprise the heavy use season in the Rodman Mountains Area. These months have an impact of approximately 6,250 vehicles and 24,000 people in this study area.
5. The months of January, September, and December average one half as many visitors per month as an average month during the heavy use season, resulting in 1,560 vehicles and 6,000 people in the area during these months.
6. Visitor use during a typical summer month is 25 percent of an average month during the heavy use season resulting in an estimated recreation impact of 780 vehicles and 3,000 people.

The total average annual recreation visitor use on the Public Domain lands in the Rodman Mountains Area is approximately 8,600 vehicles and 33,000 visitors.

VISITOR USE SURVEY - RODMAN MOUNTAINS - BARSTOW

A. Introduction

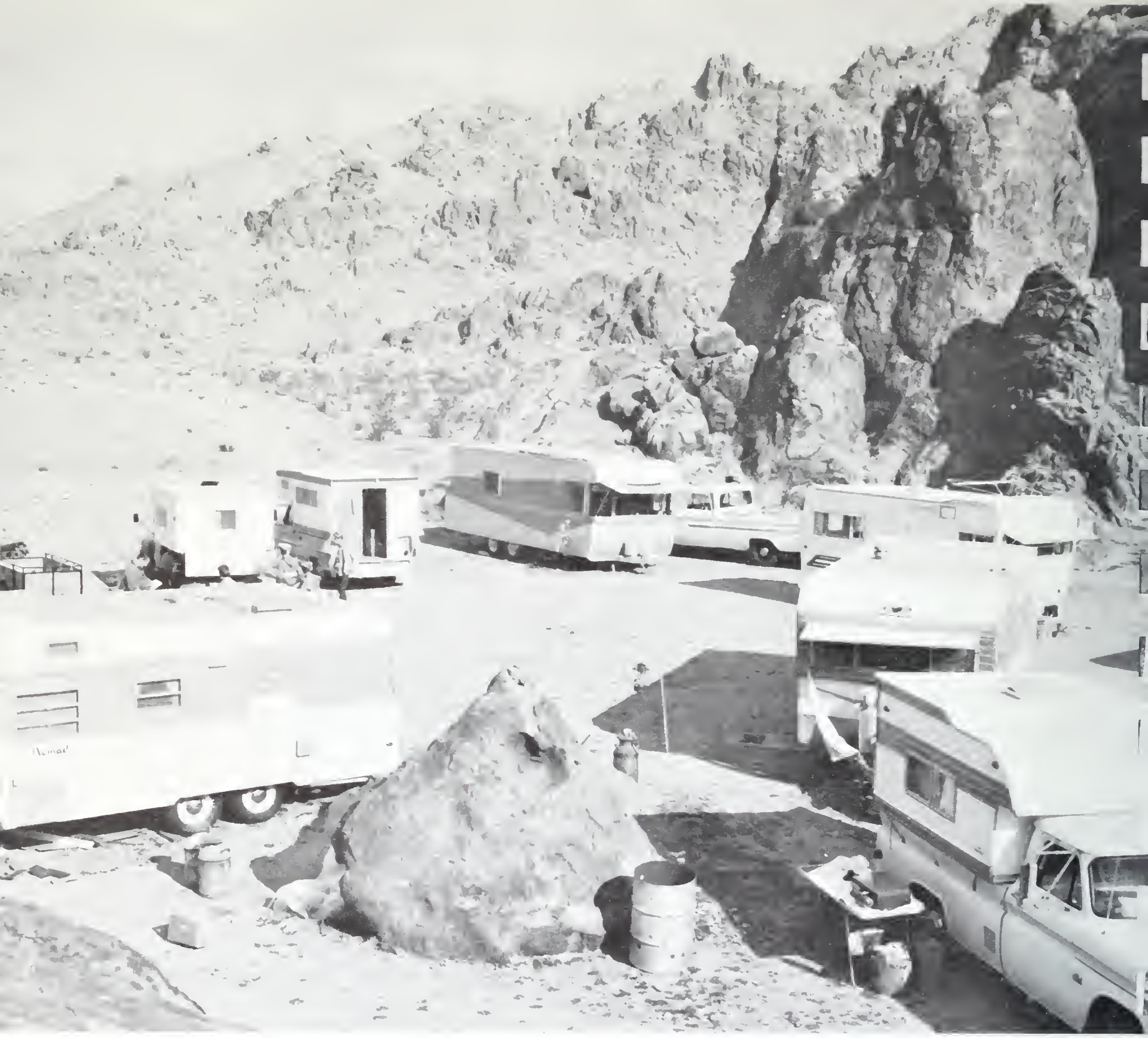
1. All calculations are based on recreation visits to BLM lands only.

B. Interview and Observation Results

	Total Number	% of Total
1. Vehicles		
Sedans	9	31
Pickup-Camper	17	59
*Motorcycles	26	
4-wheel drive	3	10
*Trailers	4	
*Dune Buggies	2	
2. Number of People		
$\frac{109 \text{ persons}}{29 \text{ vehicles}} = 3.8$ persons/vehicle		
3. Ages of Visitors		
Up to 12	27	25
13 to 19	22	20
20 or over	60	55
4. Kind of Visit		
Weekend - 0 - night	12	71
Day Use	5	29
5. Distance to Home		
Within 50	3	18
50 - 100	1	6
100 - 150	9	53
Over 150	4	23
6. Miles Traveled Today		
0	8	47
Within 50	2	12
50 - 100	1	6
100 - 150	1	6
Over 150	5	29
7. Length of Stay		
Up to 4 hours	2	12
4 - 8 hours	5	29
1 day	1	6
2 days	2	12
Over 2 days	7	41
8. Frequency of Visit		
1 per week	1	6
2 per month	2	12
1 per month	1	6
2-3 per year	8	47
First Time	5	29

*Associated with one of the other vehicles

	Total Number	% of Total
9. Activities Participated in		
Sightseeing	10	29
Picnicking	2	6
Camping	8	23
Hiking	7	20
Hunting	2	6
Rockhounding	3	7
Motorcycling	2	6
Dune Buggy Travel	1	3
10. Most Important Activity		
Motorcycling	1	6
Sightseeing	5	29
Camping	8	47
Hunting	2	12
Rockhounding	1	6
11. Rating of Site as Destination		
Main Destination	14	82
Equal Destination	3	18



This is an unorganized group of twelve neighbors and friends who get together occasionally and visit different areas of the desert. This was their first visit to the Rodman Mountains near Barstow.

The vehicles seen here are representative of types found in the Rodman Mountains Area near Barstow.

AFTON CANYON - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Afton Canyon Area near Barstow, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 7th, 10th, 11th, and 23rd of February, 24th of March, and the 12th and 13th of April, 1968.
3. Traffic count readings were recorded and ground observations were made for the study area.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 25 vehicles were in the area. Multiplying the vehicle count by 2.8, the average number of people per vehicle in the area, gives a total of 70 people. This results in approximately 125 vehicles and 350 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 320 vehicles and 900 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 445 vehicles and 1,250 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of February, March, April, May, October, and November comprise the heavy use season in the Afton Canyon Area. These months have an impact of approximately 11,000 vehicles and 30,000 people in this study area.
5. The months of January, September, and December average one half as many visitors per month as an average month during the heavy use season, resulting in 2,670 vehicles and 7,500 people in the area during these months.
6. Visitor use during a typical summer month is 25 percent of an average month during the heavy use season resulting in an estimated recreation impact of 1,335 vehicles and 3,750 people.

The total average annual recreation visitor use of the Public Domain lands in the Afton Canyon Recreation Area is approximately 15,000 vehicles and 42,000 visitors.

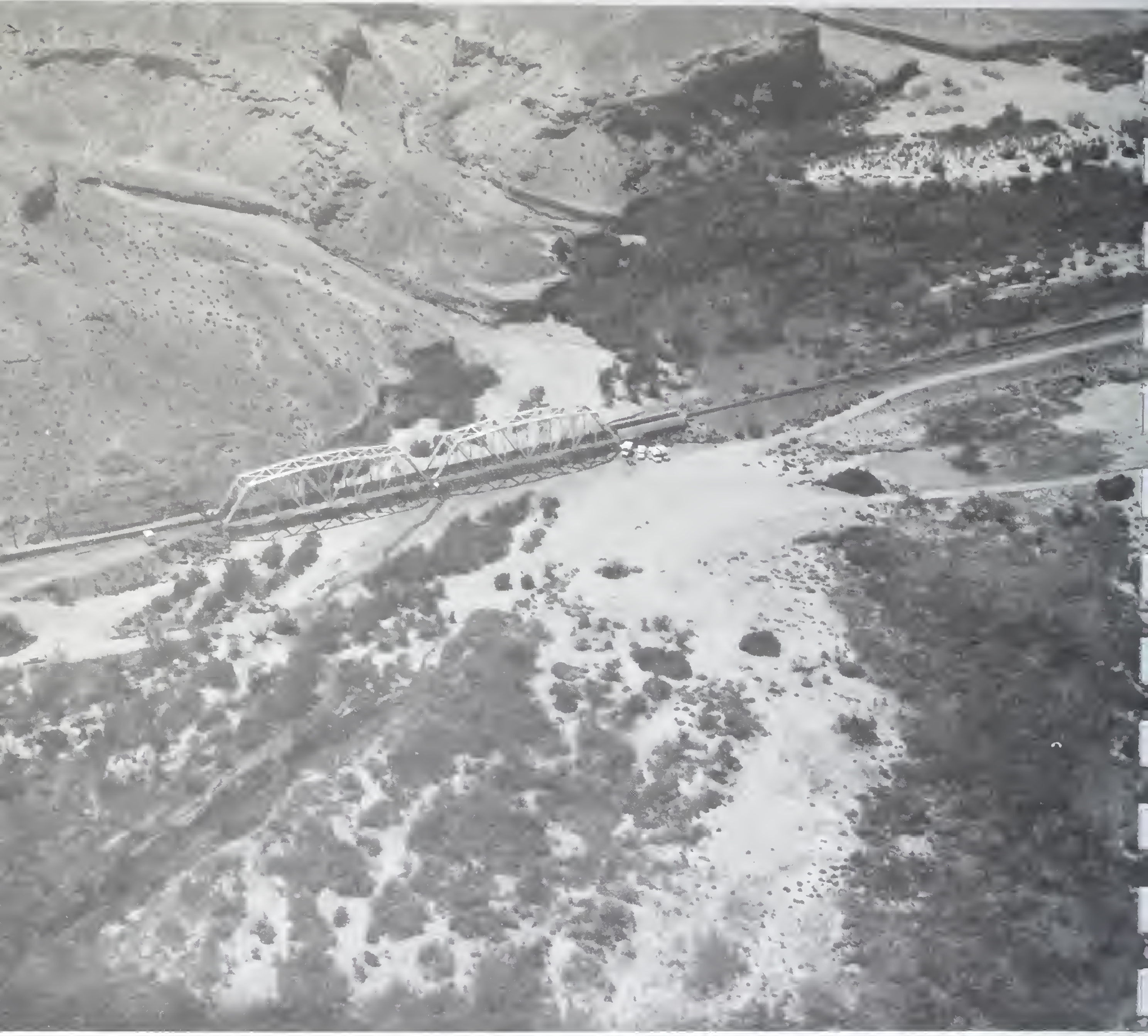
VISITOR USE SURVEY - AFTON CANYON - BARSTOW

A. Introduction

1. All calculations are based on recreation visits to BLM lands only.

B. Interview and Observation Results

1. Vehicles	Total Number	% of Total
Sedans	2	50
Pickup-Camper	1	25
Motor-Home	1	25
2. Number of People		
$\frac{\text{11 persons}}{\text{4 vehicles}}$ = 2.8 persons/vehicle		
3. Ages of Visitors		
13 to 19	2	18
20 or over	9	82
4. Kind of Visit		
Weekend - 0 - night	4	100
5. Distance to Home		
100 - 150	1	25
Over 150	3	75
6. Miles Traveled Today		
0	2	50
50 - 100	1	25
100 - 150	1	25
7. Length of Stay		
Up to 4 hours	1	25
1 day	1	25
2 days	2	50
8. Frequency of Visit		
1 per month	1	25
2-3 per year	2	50
First Time	1	25
9. Activities Participated in		
Sightseeing	2	22
Picnicking	1	12
Camping	3	33
Rockhounding	3	33
10. Most Important Activity		
Sightseeing	1	25
Camping	1	25
Rockhounding	2	50
11. Rating of Site as Destination		
Main Destination	1	25
Equal Destination	1	25
Secondary Destination	2	50



The natural values associated with the Mojave River near this railroad bridge in Afton Canyon are a major reason why visitors concentrate here.

Recreation use of the Afton Canyon area varies from rockhounding and hunting to sightseeing, with heavy concentrations of visitors in the canyon itself.

BIGHORN MOUNTAINS - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Bighorn Mountains Area near Yucca Valley, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 2nd, 3rd, 6th, 24th of February, 23rd of March, and the 13th of April, 1968.
3. Ground observations were made for the study area.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 5 vehicles were in the area. Multiplying the vehicle count by 2.0, the average number of people per vehicle in the area, gives a total of 23 people. This results in approximately 25 vehicles and 50 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 100 vehicles and 380 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 125 vehicles and 430 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of February, March, April, May, and October comprise the heavy use season in the area. These months have an impact of approximately 2.500 vehicles and 8,600 people.
5. The months of January, September, November, and December average one half as many visitors per month as an average month during the heavy use season, resulting in 1,000 vehicles and 3,500 people.
6. Visitor use during a typical summer month is 25 percent of an average month during the heavy use season resulting in an estimated recreation impact of 375 vehicles and 1,300 people.

The total average annual recreation visitor use on the Public Domain lands in the Bighorn Mountains Recreation Area is approximately 3,875 vehicles and 13,500 visitors.

VISITOR USE SURVEY - BIGHORN MOUNTAINS - YUCCA VALLEY

A. Introduction

1. All calculations are based on recreation visits to BLM lands only.

B. Interview and Observation Results

1. Vehicles	Total Number	% of Total
Sedans	2	33

	Total Number	% of Total
Pickup-Camper	2	33
Motorcycles	1	17
4-wheel drive	1	17
2. Number of People		
$\frac{\text{12 persons}}{\text{6 vehicles}}$ = 2.0 persons/vehicle		
3. Ages of Visitors		
13 to 19	3	31
20 or over	9	69
4. Kind of Visit		
Weekend - 0 - night	3	50
Day Use	3	50
5. Distance to Home		
50 - 100	1	17
100 - 150	5	83
6. Miles Traveled Today		
0	2	34
100 - 150	2	33
Over 150	2	33
7. Length of Stay		
Up to 4 hours	1	17
1 day	2	33
2 days	2	33
Over 2 days	1	17
8. Frequency of Visit		
2 per month	2	34
2-3 per year	2	33
First Time	2	33
9. Activities Participated in		
Sightseeing	2	17
Picnicking	1	8
Camping	3	25
Hiking	2	17
Hunting	1	8
Rockhounding	2	17
Motorcycling	1	8
10. Most Important Activity		
Rockhounding	1	17
Sightseeing	1	17
Camping	2	33
Hunting	1	17
Hiking	1	17
11. Rating of Site as Destination		
Main Destination	5	83
Not Destination	1	17

EASTERN MOJAVE - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Eastern Mojave Area north of Essex, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 2nd, 3rd, 6th, 8th, and 24th of February, 23rd of March, and the 13th of April, 1968.
3. Traffic count readings were recorded and ground observations were made for the study area.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 16 vehicles were in the area. Multiplying the vehicle count by 4.6, the average number of people per vehicle in the area, gives a total of 74 people. This results in approximately 80 vehicles and 370 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 130 vehicles and 600 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 210 vehicles and 970 people in the area during an average week in the heavy use season.
4. Through field observation it was determined that the months of February, March, April, May, and October comprise the heavy use season in the area. These months have an impact of approximately 4,200 vehicles and 19,300 people.
5. The months of January, September, October, and December average one half as many visitors per month as an average month during the heavy use season, resulting in 1,680 vehicles and 7,750 people.
6. Visitor use during a typical summer month is 25 percent of an average month during the heavy use season resulting in an estimated recreation impact of 630 vehicles and 2,900 people.

The total average annual recreation visitor use on the Public Domain lands in the Eastern Mojave Recreation Area is approximately 6,500 vehicles and 30,000 visitors.

VISITOR USE SURVEY - EASTERN MOJAVE - NORTH OF ESSEX

A. Introduction

1. All calculations are based on recreation visits to BLM lands only.

B. Interview and Observation Results

1. Vehicles	Total Number	% of Total
Sedans	7	33
Pickup-Camper	12	57
*Motorcycles	12	
4-wheel drive	2	10
*Dune Buggies	7	
2. Number of People		
$\frac{\text{97 persons}}{\text{21 vehicles}}$ = 4.6 persons/vehicle		
3. Ages of Visitors		
Up to 12	27	28
13 to 19	16	17
20 or over	54	56
4. Kind of Visit		
Vacation	1	10
Weekend - 0 - night	6	90
5. Distance to Home		
Over 150	7	100
6. Miles Traveled Today		
0	2	30
Over 150	5	70
7. Length of Stay		
1 day	1	10
2 days	4	60
Over 2 days	2	30
8 Frequency of Visit		
1 per month	5	80
2-3 per year	1	10
First Time	1	10
9. Activities Participated in		
Sightseeing	7	37
Camping	7	37
Hunting	1	5
Rockhounding	2	11
Motorcycling	1	5
Shooting	1	5
10. Most Important Activity		
Motorcycling	1	10
Camping	5	80
Dune Buggy Travel	1	10

*Associated with one of the other vehicles

11. Rating of Site as Destination	Total Number	% of Total
Main Destination	4	60
Equal Destination	1	10
Secondary Destination	2	30

CHUCKWALLA - VISITOR USE ESTIMATED

To arrive at an estimate of recreation use in the Chuckwalla Area west of Blythe, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 2nd, 3rd, 4th, 5th, and 24th of February, 23rd of March, and the 12th of April, 1968.
3. Ground observations were made for the study area during the months of February, March, and April, 1968.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 25 vehicles were in the area. Multiplying the vehicle count by 2.4, the average number of people per vehicle in this area, gives a total of 60 people. This results in approximately 125 vehicles and 300 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 150 vehicles and 360 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 275 vehicles and 660 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of January, February, March, April, October, November, and December comprise the heavy use season in the area. These months have an impact of approximately 7,700 vehicles and 18,500 people.
5. The months of May and September average one half as many visitors per month as an average month during the heavy use season, resulting in 1,100 vehicles and 2,650 people.
6. Visitor use during a typical summer month is 10 percent of an average month during the heavy use season resulting in an estimated recreation impact of 800 vehicles and 2,000 people.

The total average annual recreation visitor use on the Public Domain lands in the Chuckwalla Recreation Area is approximately 9,600 vehicles and 23,000 visitors.

VISITOR USE SURVEY - CHUCKWALLA'S - BLYTHE
(CORN SPRINGS - WILEY WELL - COON HOLLOW)

A. Introduction

1. All calculations are based on recreation visits to BLM lands only.

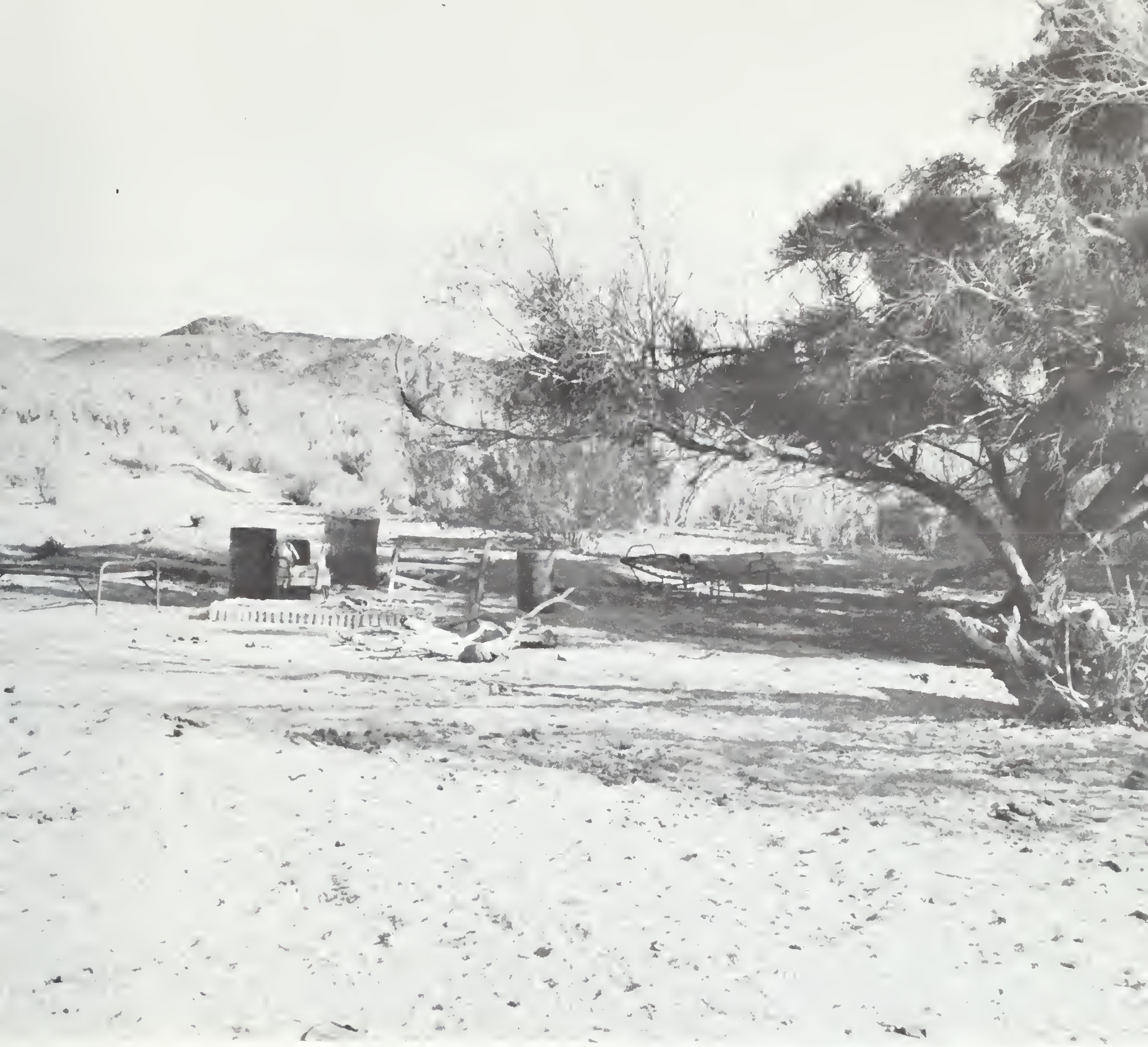
B. Interview and Observation Results

	Total Number	% of Total
1. Vehicles		
Sedans	11	52
Pickup-Camper	10	48
*Motorcycles	6	
*Trailers	16	
2. Number of People		
50 persons	= 2.4 persons/vehicle	
21 vehicles		
3. Ages of Visitors		
Up to 12	4	8
13 to 19	2	4
20 or over	44	88
4. Kind of Visit		
**Wintering	6	50
Vacation	1	8
Weekend - 0 - night	4	34
Day Use	1	8
5. Distance to Home		
Over 150	12	100
6. Miles Traveled Today		
0	10	83
Over 150	2	17
7. Length of Stay		
1 day	3	25
2 days	2	17
Over 2 days	7	58
8. Frequency of Visit		
2-3 per year	3	25
1 per year	7	58
First Time	2	17
9. Activities Participated in		
Sightseeing	2	9
Camping	8	38
Rockhounding	10	48
Hunting Snakes	1	5
10. Most Important Activity		
Camping	2	17
Rockhounding	10	83

*Associated with one of the other vehicles
**"Retired, Traveling and Rockhounding"

11. Rating of Site as Destination	Total Number	% of Total
Main Destination	11	92
Equal Destination	1	8

Recreation visitor use concentrates along the vegetative covered washes in the Chuckwalla Recreation Area west of Blythe.



Visitor "leavings" near Wiley's Well in the Chuckwalla Recreation Area.

MECCA HILLS - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Mecca Hills Area near Indio, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 2nd, 3rd, 4th, 5th, and 24th of February, 24th of March, and the 12th of April, 1968.
3. Ground observations were made for the study area during the months of February, March, and April, 1968.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 7 vehicles were in the area. Multiplying the vehicle count by 3.3, the average number of people per vehicle in the area, gives a total of 23 people. This results in approximately 35 vehicles and 115 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 110 vehicles and 365 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 145 vehicles and 480 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of January, February, March, April, October, November, and December comprise the heavy use season. These months have an impact of approximately 4,060 vehicles and 13,400 people.
5. The months of May and September average three fourths as many visitors per month as an average month during the heavy use season, resulting in 870 vehicles and 2,900 people.

The total average annual recreation visitor use on the Public Domain lands in the Mecca Hills Recreation Area is approximately 5,800 vehicles and 19,000 visitors.

VISITOR USE SURVEY - MECCA HILLS - NEAR INDIO

A. Interview and Observation Results

	Total Number	% of Total
1. Vehicles		
Sedans	7	44
Pickup-Camper	8	50
4-wheel drive	1	6
*Trailers	2	
*Dune Buggy	1	
2. Number of People		
53 persons 16 vehicles	=3.3 persons/vehicle	
3. Ages of Visitors		
Up to 12	21	40
13 to 19	3	6
20 or over	29	54
4. Kind of Visit		
Vacation	1	9
Weekend - 0 - night	9	82
Day Use	1	9
5. Distance to Home		
Within 50	0	9
50 - 100	2	18
100 - 150	3	27
Over 150	5	46
6. Miles Traveled Today		
0	3	28
Within 50	1	9
50 - 100	2	18
100 - 150	4	36
Over 150	1	9
7. Length of Stay		
Up to 4 hours	2	18
1 day	3	27
2 days	3	27
Over 2 days	3	28
8. Frequency of Visit		
2 per month	1	9
2-3 per year	6	55
1 per year	2	18
First Time	2	18
9. Activities Participated in		
Sightseeing	6	20
Picnicking	3	10
Camping	10	33
Hiking	8	27
Rockhounding	1	3
Fishing from canal bank	2	7

*Associated with one of the other vehicles

10. Most Important Activity	Total Number	% of Total
Hiking	3	27
Sightseeing	3	27
Camping	5	46
11. Rating of Site as Destination		
Main Destination	11	100

An overall view of the Mecca Hills shows the sawtooth carving of the terrain which allows for the isolation of the recreation user.

Climbing hillsides is a form of relaxation participated in by young and old throughout the California Desert.

SCOUTING ACTIVITIES - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use by Scout groups in the study area, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 2nd, 3rd, 4th, 5th, 6th, 10th, 11th, 23rd, 24th, and 25th of February, 22nd, 23rd, and 24th of March, and the 12th and 13th of April, 1968.
3. Ground observations were made for the study area during the months of February, March, and April, 1968.
4. Analyze existing data.

In analyzing the above information, the following visitor use data was developed:

1. For average weekend use during the heavy use season it was determined that approximately 45 Scout Troops and 1350 Scouts visit the desert. Each Scout Troop averages two trips a year to the desert.
2. Through field observations it was determined that the months of February, March, April, May, October, and November comprise the heavy use season in the desert. These months have an impact of approximately 194,000 visitor days.
3. The months of January, September, and December average one half as many visits per month as an average month during the heavy use season, resulting in approximately 49,000 visitor days of use during these months.
4. Visitor use during a typical summer month is 10 percent of an average month during the heavy use season resulting in an estimated impact of 9,000 visitor days.

The total average annual recreation visitor use on the Public Domain lands in the desert area is approximately 252,000 visitor days of use.

VISITOR USE SURVEY - BOY SCOUT TROOPS - MECCA HILLS

A. Introduction

1. On 2/3 and 3/16, 1968, four boy scout troops were interviewed in the area of Mecca Hills.

B. Interview and Observation Results

	Total Number	% of Total
1. Ages of Visitors		
Up to 12	93	76
13 to 19	8	6
20 or over	22	18
2. Kind of Visit		
Weekend - 0 - night	4	100

	Total Number	% of Total
3. Distance to Home		
Within 50	1	25
50 - 100	1	25
100 - 150	2	50
4. Miles Traveled Today		
0	1	25
Within 50	1	25
50 - 100	1	25
100 - 150	1	25
5. Length of Stay		
1 day	1	25
2 days	2	50
Week	1	25
6. Frequency of Visit		
2-3 per year	1	25
1 per year	3	75
7. Activities Participated in		
Sightseeing	4	36
Camping	3	28
Hiking	4	36
8. Most Important Activity		
Camping	3	75
Hiking	1	25
9. Rating of Site as Destination		
Main Destination	4	100

This scene is representative of a typical Boy Scout troop outing in the California Desert.

Scattered stands of palm trees found in the Mecca Hills attract many visitors including numerous groups of Boy Scouts.

IMPERIAL SAND HILLS - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Imperial Sand Hills Area near Brawley, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 2nd, 3rd, 4th, 5th, and 24th of February, 24th of March, and the 12th of April, 1968.
3. Ground observations were made for the study area during the months of February, March, and April, 1968.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 28 vehicles were in the area. Multiplying the vehicle count by 3.5, the average number of people per vehicle in the area, gives a total of 98 people. This results in approximately 140 vehicles and 490 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 270 vehicles and 930 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 410 vehicles and 1,400 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of January, February, March, April, October, November, and December comprise the heavy use season. These months have an impact of approximately 11,500 vehicles and 40,000 people.
5. The months of May and September average three fourths as many visitors per month as an average month during the heavy use season, resulting in 2,450 vehicles and 8,500 people.
6. Visitor use during a typical summer month is 50 percent of an average month during the heavy use season resulting in an estimated recreation impact of 2,450 vehicles and 8,500 people

The total average annual recreation visitor use on the Public Domain lands in the Imperial Sand Hills Recreation Area is approximately 16,400 vehicles and 57,000 visitors.

VISITOR USE SURVEY - IMPERIAL SAND HILLS - BRAWLEY

A. Introduction

1. All calculations are based on recreation visits to BLM lands only.

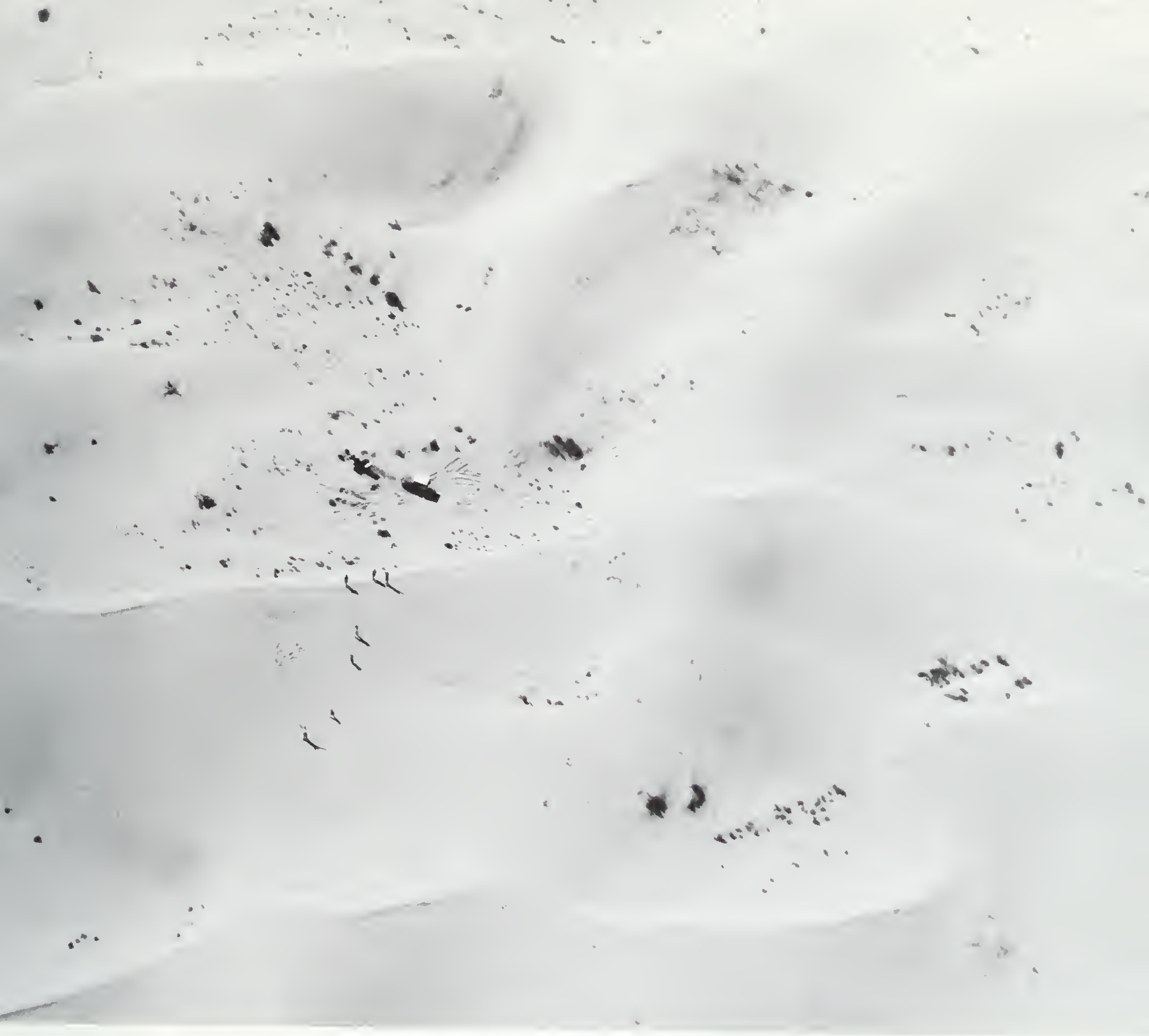
B. Interview and Observation Results

	Total Number	% of Total
1. Vehicles		
Sedans	7	21
Pickup-Camper	24	70
*Motorcycles	1	
4-wheel drive	3	9
*Trailers	5	
*Dune Buggies	29	
2. Number of People		
119 persons 34 vehicles =3.5 persons/vehicle		
3. Ages of Visitors		
Up to 12	31	26
13 to 19	16	13
20 or over	72	61
4. Kind of Visit		
Weekend - 0 - night	11	85
Day Use	2	15
5. Distance to Home		
Within 50	2	15
100 - 150	4	31
Over 150	7	54
6. Miles Traveled Today		
0	10	77
Within 50	2	15
50 - 100	1	8
7. Length of Stay		
Up to 4 hours	1	8
1 day	2	15
2 days	9	69
Over 2 days	1	8
8. Frequency of Visit		
2 per month	3	23
1 per month	5	38
2-3 per year	4	31
First Time	1	8
9. Activities Participated in		
Sightseeing	4	16
Picnicking	1	4
Camping	8	32
Rockhounding	1	4
Dune Buggy Travel	11	44

*Associated with one of the other vehicles

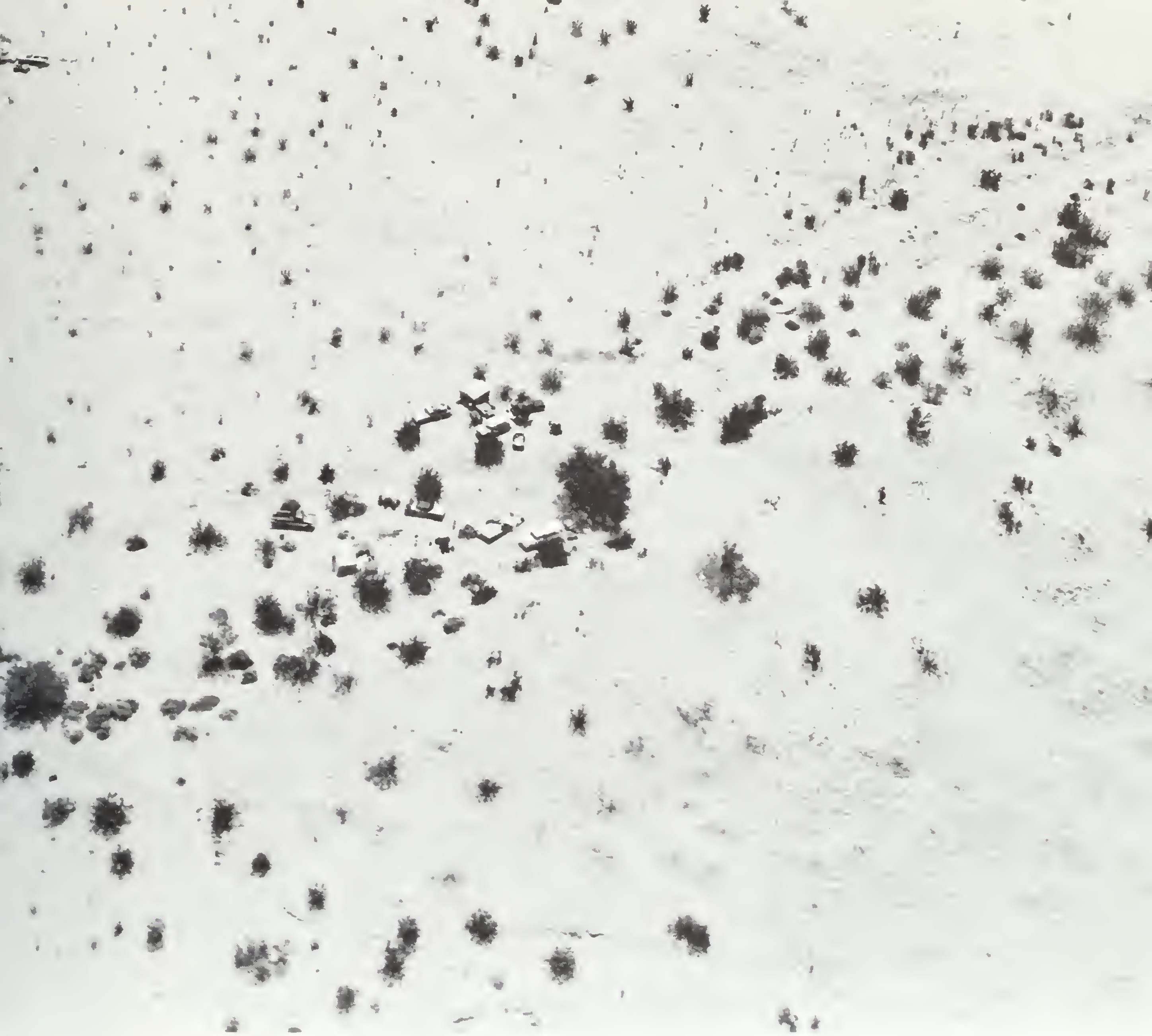
10. Most Important Activity	Total Number	% of Total
Picnicking	1	8
Camping	1	7
Dune Buggy Travel	11	85
11. Rating of Site as Destination		
Main Destination	12	92
Equal Destination	1	8

This is a partial view of the Imperial Sand Hills looking south towards the Mexican border.



A majority of use on the Imperial Sand Hills occurs during daylight hours; however, nighttime dune driving is growing in popularity.

Dune buggy use of the Imperial Sand Hills is quite heavy during the fall, winter, and spring weekends.



Visitors to the Imperial Sand Hills gather in scattered clusters near the small community of Glamis.

PICACHO - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Picacho Area northwest of Yuma, Arizona, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 5th and 24th of February, 24th of March, and the 12th of April, 1968.
3. Ground observations were made for the study area during the months of February, March, and April, 1968.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 11 vehicles were in the area. Multiplying the vehicle count by 2.8, the average number of people per vehicle in the area, gives a total of 31 people. This results in approximately 55 vehicles and 154 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 125 vehicles and 350 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 180 vehicles and 500 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of January, February, March, April, October, November, and December comprise the heavy use season. These months have an impact of approximately 5,000 vehicles and 14,000 people.
5. The months of May and September average three fourths as many visitors per month as an average month during the heavy use season, resulting in 1,100 vehicles and 3,000 people.
6. Visitor use during a typical summer month is 50 percent of an average month during the heavy use season resulting in an estimated recreation impact of 1,100 vehicles and 3,000 people.

The total average annual recreation visitor use on the Public Domain lands in the Picacho Recreation Area is approximately 7,200 vehicles and 20,000 visitors.

VISITOR USE SURVEY - PICACHO

A. Introduction

1. All calculations are based on recreation visits to BLM lands only.

B. Interview and Observation Results

	Total Number	% of Total
1. Vehicles		
Sedans	2	40
Pickup-Camper	2	40
4-wheel drive	1	20
*Trailers	1	
2. Number of People		
$\frac{\text{14 persons}}{\text{5 vehicles}}$ = 2.8 persons/vehicle		
3. Ages of Visitors		
20 or over	14	100
4. Kind of Visit		
Weekend - 0 - night	4	66
Day Use	1	34
5. Distance to Home		
Within 50	1	17
Over 150	5	83
6. Miles Traveled Today		
0	2	33
Within 50	3	50
50 - 100	1	17
7. Length of Stay		
Up to 4 hours	1	17
2 days	1	17
Over 2 days	4	66
8. Frequency of Visit		
2 per month	1	17
1 per year	3	50
First Time	2	33
9. Activities Participated in		
Sightseeing	2	33
Camping	1	17
Rockhounding	2	33
Painting	1	17
10. Most Important Activity		
Sightseeing	4	66
Rockhounding	2	34
11. Rating of Site as Destination		
Main Destination	6	100

*Associated with one of the other vehicles

Remains of old mining operations and other points of historical interest also draw visitors to the Picacho Area.

Landscape painting is one of the attractions which brings people to the California Desert lands in the Picacho area.

YUHA DESERT - PAINTED GORGE
VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Yuha Desert-Painted Gorge area west of El Centro, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 2nd, 3rd, 4th, 5th, and 24th of February, 24th of March, and the 12th of April, 1968.
3. Ground observations were made for the study area during the months of February, March, and April, 1968.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 7 vehicles were in the area. Multiplying the vehicle count by 4.1, the average number of people per vehicle in the area, gives a total of 29 people. This results in approximately 35 vehicles and 145 people visiting the area during the weekdays in the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 175 vehicles and 700 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 210 vehicles and 860 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of January, February, March, April, October, November, and December comprise the heavy use season. These months have an impact of approximately 5,900 vehicles and 24,000 people.
5. The months of May and September average three fourths as many visitors per month as an average month during the heavy use season, resulting in 1,260 vehicles and 5,200 people.
6. Visitor use during a typical summer month is 50 percent of an average month during the heavy use season resulting in an estimated recreation impact of 1,260 vehicles and 5,200 people.

The total average annual recreation visitor use on the Public Domain lands in the Yuha Desert-Painted Gorge Recreation Area is approximately 8,400 vehicles and 34,500 visitors.

VISITOR USE SURVEY - YUHA DESERT (Painted Gorge) - EL CENTRO

A. Introduction

1. All calculations are based on recreation visits to BLM lands only.

B. Interview and Observation Results

1. Vehicles	Total Number	% of Total
Sedans	25	64
Pickup-Camper	10	26
*Motorcycles	11	
4-wheel drive	4	10
*Trailers	2	
*Dune Buggies	4	
2. Number of People		
158 persons 39 Vehicles = 4.1 persons/vehicle		
3. Ages of Visitors		
Up to 12	54	34
13 to 19	19	12
20 or over	85	54
4. Kind of Visit		
Vacation	1	4
Weekend - 0 - night	7	27
Day Use	18	69
5. Distance to Home		
Within 50	4	15
50 - 100	1	4
100 - 150	5	19
Over 150	16	62
6. Miles Traveled Today		
0	10	38
Within 50	1	4
50 - 100	4	15
100 - 150	2	8
Over 150	9	35
7. Length of Stay		
Up to 4 hours	8	30
4 to 8 hours	9	35
1 day	1	4
2 days	7	27
Over 2 days	1	4
8. Frequency of Visit		
1 per week	1	4
2 per month	1	4
1 per month	1	4
2-3 per year	8	30
1 per year	2	8
First Time	13	50

*Associated with one of the other vehicles

9. Activities Participated in		
Sightseeing	20	39
Picnicking	8	16
Camping	8	16
Hiking	9	17
Hunting		
Rockhounding	1	2
Motorcycling	3	6
Dune Buggy Travel	2	4
10. Most Important Activity		
Picnicking	7	27
Sightseeing	10	38
Camping	5	19
Hiking	1	4
Motorcycling	2	8
Dune Buggy	1	4
11. Rating of Site as Destination		
Main Destination	15	57
Equal Destination	9	35
Not Destination	2	8

Typical recreation use in the Painted Gorge area of the Yuha Desert.

Activity in the Yuha Desert Recreation Area ranges from motorcycle riding, dune buggy travel, and rockhounding to overall enjoyment of the desert scenery.

YUHA DESERT VICINITY - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use in the Yuha Desert Vicinity area west of El Centro, California, the following procedure was used:

1. A uniform field survey was conducted to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 2nd, 3rd, 4th, 5th, and 24th of February, 24th of March, and the 12th of April, 1968.
3. Ground observations were made for the study area during the months of February, March, and April, 1968.

In analyzing the above information, the following visitor use data was developed:

1. For average weekday use during the heavy use seasons it was determined that 12 vehicles were in the area. Multiplying the vehicle count by 3.1, the average number of people per vehicle in the area, gives a total of 37 people. This results in approximately 60 vehicles and 185 people visiting the area during the heavy use season.
2. For average weekend use during the heavy use season it was determined that approximately 210 vehicles and 650 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 270 vehicles and 840 people in the area during an average week in the heavy use season.
4. Through field observations it was determined that the months of January, February, March, April, October, November, and December comprise the heavy use season. These months have an impact of approximately 7,600 vehicles and 23,600 people.
5. The months of May and September average three fourths as many visitors per month as an average month during the heavy use season, resulting in 1,860 vehicles and 5,750 people.
6. Visitor use during a typical summer month is 50 percent of an average month during the heavy use season resulting in an estimated recreation impact of 1,860 vehicles and 5,750 people.

The total average annual recreation visitor use on the Public Domain lands in the Yuha Desert Vicinity is approximately 11,300 vehicles and 35,000 visitors.

VISITOR USE SURVEY - YUHA DESERT VICINITY - EL CENTRO

A. Introduction

1. All calculations are based on recreation visits to BLM lands only.

B. Interview and Observation Results

	Total Number	% of Total
1. Vehicles		
Sedans	3	11
Pickup-Camper	23	82
*Motorcycles	13	
4-wheel drive	2	7
*Dune Buggies	4	
2. Number of People		
87 persons 28 vehicles = 3.1 persons/vehicle		
3. Ages of Visitors		
Up to 12	22	25
13 to 19	5	6
20 or over	60	69
4. Kind of Visit		
Vacation	1	7
Weekend - 0 - night	7	47
Day Use	7	46
5. Distance to Home		
Within 50	6	40
50 - 100	2	13
100 - 150	1	7
Over 150	6	40
6. Miles Traveled Today		
0	3	20
Within 50	4	27
50 - 100	2	13
100 - 150	3	20
Over 150	3	20
7. Length of Stay		
Up to 4 hours	6	40
4 - 8 hours	2	13
1 day	1	7
2 days	4	27
Over 2 days	2	13

*Associated with one of the other vehicles

		Total Number	% of Total
8.	Frequency of Visit		
	1 per week	2	13
	2 per month	1	7
	1 per month	1	7
	2-3 per year	3	20
	1 per year	3	20
	First Time	5	33
9.	Activities Participated in		
	Sightseeing	9	26
	Picnicking	3	9
	Camping	8	24
	Hiking	1	3
	Rockhounding	5	15
	Motorcycling	5	15
	Dune Buggy Driving	3	8
10.	Most Important Activity		
	Picnicking	1	7
	Sightseeing	6	40
	Camping	5	33
	Rockhounding	2	13
	Motorcycling	1	7
11.	Rating of Site as Destination		
	Main Destination	9	60
	Equal Destination	6	40

SCATTERED DESERT AREAS - VISITOR USE ESTIMATES

To arrive at an estimate of recreation use on lands in the study area that fall outside the major use sites, the following procedure was used:

1. A uniform field survey was conducted on five randomly selected areas to acquire basic recreation information.
2. Aerial reconnaissance flights were flown on the 2nd, 3rd, 4th, 5th, 6th, 10th, 11th, 23rd, 24th, and 25th of February, 22nd, 23rd, and 24th of March, and the 12th and 13th of April, 1968.

A typical flight is recorded below indicating the scattered use in the north segment of the study area.

Area	Approx. No. of People	Campers or Tents	Motor-cycles (1)	Dune Buggies
Wagy Flat Allot.	6	1	2	0
Kelso Valley	25	6	0 (1)	0
Jawbone Canyon	150	35	15 (1)	1
Pine Tree Canyon Area	88	20	6 (1)	0
Mojave Jct. Hwys. 6 & 466	75	19	9 (1)	0
Dove Springs Canyon	40	11	20 (1)	0
Redrock Canyon	500	120	20 (1)	2
El Passo Mountains	450	110	20	0
Little Lake	25	6	0 (1)	0
Saline Hot Springs	35	11	0 (1)	0
Saline Valley - Panamint Valley	15	4	0 (1)	0
Keeler to Cerro Gordo	10	2	5	0
Temblor Mountains	10	2	3	3
Totals	1429	347	100	6

(1) This figure is for motorcycles observed in operation. Many of the campers had motorcycles so the total figure would probably be 2-3 times as many as observed in operation early in the day.

3. Ground observations were made for the study area during the months of February, March, and April, 1968.
4. Analyze existing data.

In analyzing the information, the following visitor use data was developed:

1. For average weekday use during the heavy use season it was determined that 1,200 vehicles were in the study area. Multiplying the vehicle count by 4.4, the average number of people per vehicle in the study area, gives a total of 5,300 people. This results in approximately 6,000 vehicles and 26,000 people visiting the area during the weekdays in the heavy use season.

2. For average weekend use during the heavy use season it was determined that approximately 20,000 vehicles and 88,000 people visited the area.
3. Combining the average weekday and weekend use figures results in approximately 26,000 vehicles and 111,000 people in the area during an average week in the heavy use season.
4. Through field observation it was determined that the months of February, March, April, May, October, and November comprise the heavy use season in the scattered desert area. These months have an impact of approximately 624,000 vehicles and 2,750,000 people.
5. The months of January, September, and December average one half as many visitors per month as an average month during the heavy use season, resulting in 156,000 vehicles and 690,000 people.
6. Visitor use during a typical summer month is 25 percent of an average month during the heavy use season resulting in an estimated recreation impact of 78,000 vehicles and 345,000 people.

The total average annual recreation visitor use on the Public Domain lands in the scattered recreation lands area is approximately 870,000 vehicles and 3,800,000 visitors.

VISITOR USE SURVEY - SCATTERED DESERT INTERVIEWS

A. Introduction

1. On February 4 and 5, and March 16, 17, and 23, interviews were made on the following selected areas of public domain land: Turtle Mountains, Whipple Mountains, Salt Springs, Cache Creek, and Butter Cup Valley.

B. Interview and Observation Results

1. Vehicles	Total Number	% of Total
Sedans	14	54
Pickup-Camper	12	46
*Motorcycles	16	
*Trailers	4	
*Dune Buggies	2	
2. Number of People		
$\frac{114 \text{ persons}}{26 \text{ vehicles}}$ = 4.4 persons/vehicle		
3. Ages of Visitors		
Up to 12	22	19
13 to 19	12	10
20 or over	80	71
4. Kind of Visit by Party		
Weekend - 0 - night	14	64
Day Use	8	36
5. Distance to Home by Party		
50 - 100	6	28
100 - 150	8	36
Over 150	8	36

*Associated with one of the other vehicles

6. Miles Traveled Today by Party	Total Number	% of Total
0	2	9
50 - 100	6	27
100 - 150	6	28
Over 150	8	36
7. Length of Stay		
1 day	10	45
2 days	8	37
Over 2 days	4	18
8. Frequency of Visit		
1 per week	2	9
2 per month	4	18
1 per month	4	18
2-3 per year	2	9
1 per year	4	18
First Time	6	29
9. Activities Participated in		
Sightseeing	12	22
Picnicking	4	7
Camping	6	11
Hiking	8	15
Hunting	4	7
Rockhounding	8	15
Motorcycling	10	19
Dune Buggy Travel	2	4
10. Most Important Activity		
Motorcycling	6	29
Rockhounding	6	28
Sightseeing	4	18
Hunting	2	9
Dune Buggy Travel	4	18
11. Rating of Site as Destination		
Main Destination	16	73
Equal Destination	4	18
Secondary Destination	2	9

Isolated stands of native fan palm trees are found in the desert. This small grouping is located in the Turtle Mountain area north of Blythe.

These visitors have driven over eight miles of very rough desert road to visit the Turtle Mountains and climb the rugged peaks.

Some of the visitors, disdaining physical comforts, bring only the barest of necessities for their desert outing.

Recreation site definition in the California Desert is unlimited, as indicated above.

ECONOMIC IMPACT OF RECREATIONAL USE

Expenditures per Party

In a recent study on California's tourism industry, prepared for the U.S. Department of Commerce by Economics Research Associates of Los Angeles, it was determined that California residents spent an average of $11.50 per party on one-day pleasure trips in 1966. On overnight trips, the average daily expenditure was $22 per party. Party size was estimated at 3.9 persons.

Survey Description

The study referred to above included a survey of the type of activities or attractions visited by the State's 18 million residents at that time. The survey responses were grouped into ten major categories, including active recreation which included such outdoor recreation participant activities as fishing, hiking, hunting, mountain climbing, rock hunting, swimming, etc. Survey data were gathered from a scientifically random sample of 1,200 household interviews throughout the State, and data were gathered for the two major categories of pleasure trips--one day and overnight.

Economic Impact of Desert Recreation Spending by Southern California Residents

The surveys conducted by BLM determined that 570 thousand parties visited desert recreation areas on one-day trips in fiscal year 1968. The desert recreation use survey data show that 1,110,000 parties made overnight trips to southern California's desert areas during the above period. Applying the conservative daily expenditure figures of $11.50 and $22 respectively, $30.9 million were expended by California residents through use of the desert for recreation purposes during F.Y. 1968.

The California Federation of Mineralogical Societies, made up of 243 member clubs, reported that their use of the southern California desert alone amounts to an annual expenditure of $2.2 million for maintenance, gasoline, restaurants, lodging, etc. Furthermore, they report that club members in the subject area have a capital investment of more than $8,700,000 in trucks, trailers, and hobby oriented equipment. While it can be argued that this money is being recirculated within southern California, it must be recognized that the residents of the area could have chosen other types of recreation within, or outside, the southern California area.

FUTURE TRENDS IN RECREATIONAL USE

The present outdoor recreation use of the desert is in its infant stage with foreseeable demands that will amaze observers over the next decade.

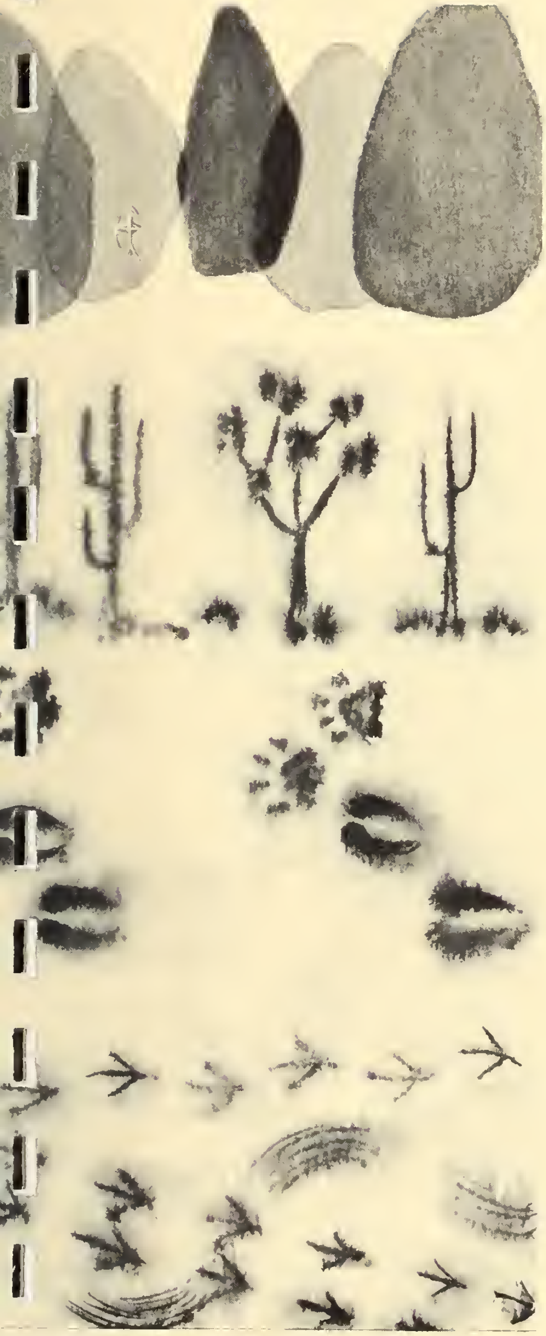
If a recreation program were to be developed as recommended in Part III "Concepts and Recommendations" in this study, it is estimated that recreation use of the desert could increase from 4.9 million visitor days at the present to nearly 50 million visitor days by the turn of the century--or shortly over 30 years from now.

This figure was obtained by analysis of past and present use patterns of Public Domain lands and lands of other public agencies managed for recreation use, along with trends of recreation use as developed by the Bureau of Outdoor Recreation. The projection methods thus established give the total figure for the year 2000.

Without developing recreation facilities or identifying areas having recreation interest, the natural increase of recreation use on public lands in the desert will increase from 4.9 million visitor days in 1968 to 7.8 million in 1980 and 13.2 million by the year 2000.

Comparable site analysis shows that identifying areas having recreation potential through a signing program would increase use three times over the projected figure. Thus, by 1980, 23.4 million visitor days of use could be expected, and 39.6 million by the turn of the century.

If the Bureau of Land Management embarked upon a program of identifying recreation areas of use, coupled with a logical recreation development program, a 25 percent increase of recreation use could be expected in addition to the above totals. Therefore, with a recreation identification, development, and management program, the Public Domain lands in the California desert could expect 29.3 million visitor days of use in 1980 and 49.5 million visitor days by the year 2000.



CONCEPTS AND RECOMMENDATIONS

Part III

CONCEPTS AND RECOMMENDATIONS FOR THE RECREATIONAL USE OF THE CALIFORNIA DESERT

The objective of the California Desert Study is to analyze the existing situation in the desert area as it pertains to Recreation; to develop a broad new conceptual framework based on sound multiple-use policies for the management of Public Domain lands in the California Desert area; and to make recommendations for action to conserve, develop, manage, and encourage wise recreational use of the California Desert and its resources in the interest of all Americans.

This part of the Study sets forth in detail 18 concepts and recommendations. With each, a brief statement of the present situation is given.

Part III

CONCEPTS AND RECOMMENDATIONS

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A. IDENTIFYING "RECREATION LANDS"

Present Situation

As a start on identifying Recreation Lands in the desert, 19 areas were reviewed as presently or potentially having valuable recreation resources. These areas are shown on the following map and are individually discussed under Section IV of this study, "Silhouettes of Selected California Desert Recreation Lands".

At the present time, recreational use of these areas is virtually unregulated and damage to natural, scientific, and recreational resources is occurring. Littering, unsanitary conditions, scarring of the landscape, and the removal or vandalizing of natural and historical objects are seriously affecting the recreational potential and use of these Recreation Lands.

Coupled with the problems resulting from present recreational use is the reduction and destruction of natural values in the desert by some activities of other users. However, recent advances in technology and management emphasis indicate a trend toward greater compatibility of many uses with the desert environment.

The land ownership patterns, including private inholdings, checkerboard grants, withdrawals, and state school sections within some of the Recreation Land areas impose problems for the development of their full recreation potential. Present regulations do not allow the Bureau of Land Management to purchase inholdings in order to solve these problems.

Concepts and Recommendations

A review of 19 areas in the California Desert has shown that they do have significant recreational values. These Recreation Lands will be classified for retention in public ownership and comprehensive land use plans developed to insure that the recreational values are not impaired or destroyed.

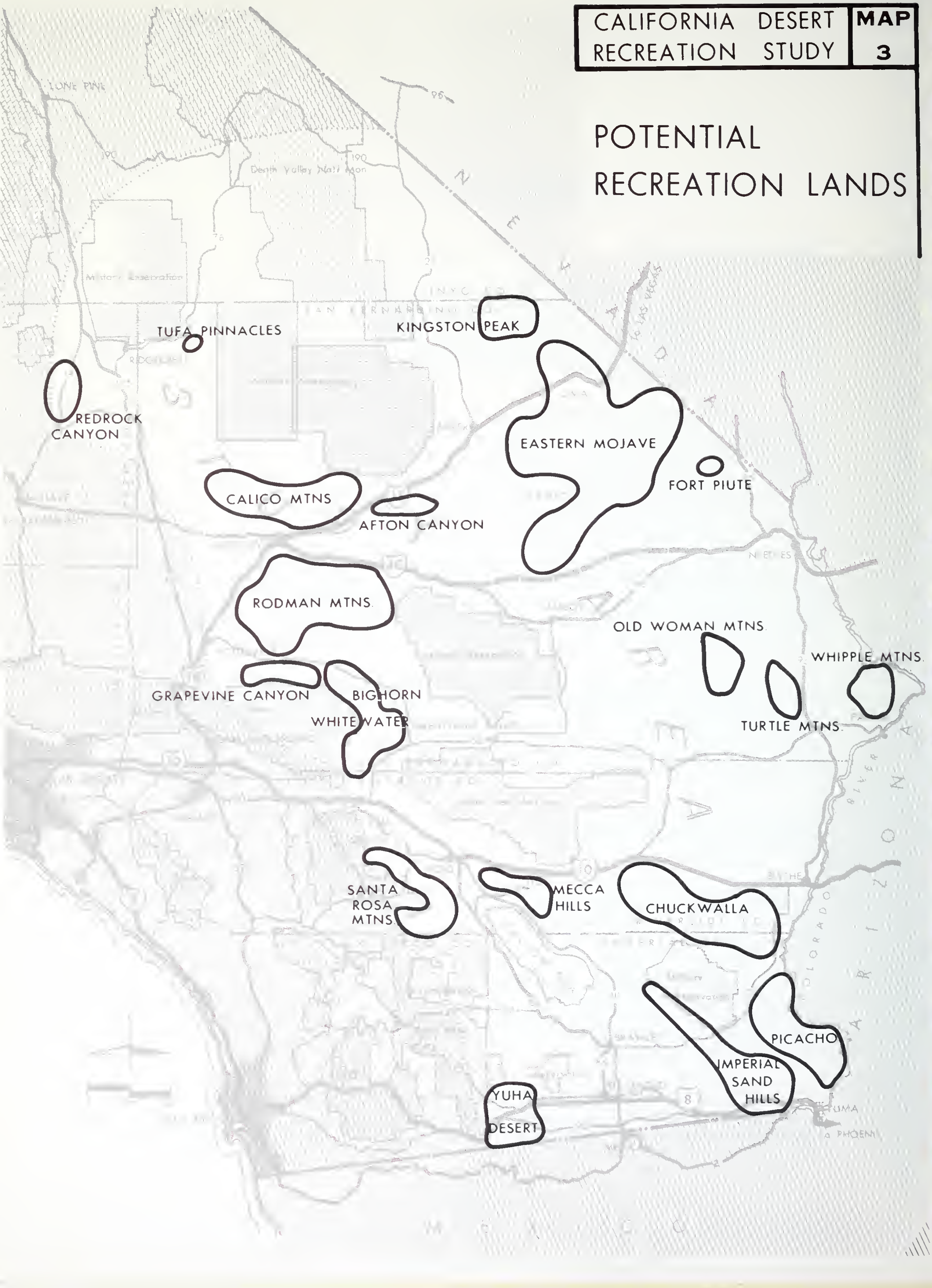
Appropriate Departmental policies should be strengthened to fully recognize the recreational values of these desert areas, and appropriate guidelines established to maintain other resource values and arrive at a compatibility of uses.

Because of present recreational use of the Public Domain lands in the California Desert it is recommended that BLM work with mining and livestock industries and other interested user groups to encourage prospecting

CALIFORNIA DESERT RECREATION STUDY

MAP 3

POTENTIAL RECREATION LANDS


TUFA PINNACLES
KINGSTON PEAK
REDROCK CANYON
EASTERN MOJAVE
FORT PIUTE
CALICO MTNS
AFTON CANYON
RODMAN MTNS.
OLD WOMAN MTNS.
WHIPPLE MTNS.
TURTLE MTNS.
GRAPEVINE CANYON
BIGHORN
WHITEWATER
SANTA ROSA MTNS.
MECCA HILLS
CHUCKWALLA
PICACHO
IMPERIAL SAND HILLS
YUHA DESERT
LONE PINE
Death Valley Nat'l Mon
NEVADA
To LAS VEGAS
INYO CO
SAN BERNARDINO CO
NEEDLES
BLYTHE
COLORADO RIVER
ARIZONA
YUMA
PHOENIX
MEXICO

techniques which would minimize surface damage, and develop, under Section 15 grazing leases, management plans that recognize the fragile character of the desert by maintaining sufficient natural vegetation to protect the land surface from damage.

Where land exchanges cannot be consummated in order to create a more favorable land pattern for the development and management of Recreation Lands, legislative authority should be sought to purchase such lands.

B. BOUNDARIES OF "RECREATION LANDS"

Present Situation

The California Desert Study Team has evaluated 19 areas selected as potential Recreation Lands, as lands containing unusual natural and scientific values as well as scenic qualities.

However, the inherent recreational qualities of these areas are vulnerable to undesirable encroachments. For example, an improperly located powerline may degrade the scenic attraction of a Recreation Land area.

The retention of some areas of public lands in their natural state provides incalculable environmental and economic values to local communities. As a case in point, to allow uncontrolled residential development on the rugged slopes of the Santa Rosa Mountains would result in indelible scars, serious erosion and flood control problems for the communities in the Coachella Valley.

Additional Recreation Land areas in the California Desert with unusual natural and scientific values will certainly be discovered or recognized as detailed planning for the desert develops and as Bureau of Land Management Unit Resources Analysis and land planning programs progress.

Concepts and Recommendations

BLM should set up criteria for determining the boundaries of Recreation Lands in the California Desert to include all potential recreational, historical, natural, and scientific values. To permit orderly transition into the recreation areas, buffer zones and approach corridors along obvious natural or man-made features should be considered. By the use of various land management alternatives in these zones or corridors, such as land classifications with segregations, special stipulations in right-of-way grants, and protective withdrawals; multiple use management would be facilitated to minimize impairment of the recreation values.

BLM should obtain the assistance and judgment of scientists and other recognized authorities in identifying these areas and in determining how best to protect and interpret their values for recreational and educational purposes.

C. USE, SALE, OR TRANSFER CONSIDERATIONS

Present Situation

Public Domain lands in many areas of the California Desert are interspersed with lands owned or administered by private individuals, corporations, or other governmental agencies. In conducting a review of the areas proposed as Recreation Lands, the study team discovered that several parcels of land had been transferred to other owners for special uses on their application under such laws as the Recreation and Public Purposes Act.

These uses, sales, or transfer actions do change administrative and management responsibilities. Applications for such actions, coming from a variety of outside sources, do not necessarily consider an overall plan for the management of Public Domain lands in the best public interest.

In some instances, lands applied for are small parcels, but they are key areas forming the core of a large area that can be managed most effectively and economically as an administrative unit.

These applications have been considered individually, on the basis of the applicant's plan of development and ability to finance the project, and the classification action has not always evaluated fully the best overall management of the California Desert area. By continuation of this procedure the Bureau of Land Management may sacrifice potential recreation attractions or interests, and end up managing the ring-around-the-bathtub.

Concepts and Recommendations

As indicated in recommendation "A", appropriate Departmental policies should be strengthened to fully recognize the recreation values of these desert areas, and appropriate guidelines established to maintain other resource values and arrive at a compatibility of uses. Within this framework, land classifications for multiple use management should be made which would recognize those uses and land transactions which are compatible with the Departmental policies. All use authorizations, the allowance of which are discretionary, should give full consideration to the impact of those uses on the recreational values. Special stipulations should be developed to permit use under adequate controls. Similarly, all transfers should be considered against the Departmental policy to determine if they can be permitted.

In areas having lands mineral in character, the mining industry and the small mining organizations should be encouraged to use those techniques in prospecting and mining that would minimize damage to the surface and to aesthetic values.

In non-mineral areas, where mining locations are made, consideration should be given to protective withdrawals to minimize the expense of repeated mineral examinations to test the validy of such claims. As it is essential for the Bureau of have knowledge of mineral activities on all lands within the study area, it is imperative that consideration be given to the adoption of a mining claim recordation statute under the U. S. mining laws.

BLM should work with the mining industry to develop the means to control surface resource damages where mining is involved that do not preclude the opportunity for legitimate mining enterprises to adequately explore and extract valuable minerals. This may necessitate legislative and regulatory changes.

Areas that are designated as Recreation Lands can provide ample space for recreation use, scientific study and protection of desert resources for all interested users under the responsibility of one management agency. This would prevent costly duplication of effort and insure the full potential use of these desert lands.

D. WITHDRAWALS AND EXCHANGES

Present Situation

On the California Desert, the Public Domain lands in several areas are interspersed with other government holdings, land withdrawn for other uses by government agencies and private lands. Considerable recreation use occurs on lands under withdrawal by other Federal agencies, substantial portions of which are surplus to those agencies' needs. Some of these lands contain evidence of trespass, are littered with trash, or contaminated with lethal military devices.

The Bureau of Land Management is directed by Departmental policy to make withdrawal reviews for all withdrawn public lands, and under Departmental regulations can accept the return of such lands as they are relinquished. However, before acceptance, BLM requires the holding agency to decontaminate the lands and to resolve any unauthorized use. In many instances, the cost of decontamination of unexploded ordnance and the termination of unauthorized use is too great for the holding agency to fit in its current programs. Also, the holding agency, upon relinquishment, is unwilling or is not legally bound to retain responsibility for any liability for tort or other claims that might arise.

Where such lands have high recreation values and are situated within, or adjoin, areas identified as having high recreational values, it is desirable that they be made a part of the Recreation Land area.

Many state school sections, railroad lands, and private tracts would become inholdings within proposed Recreation Land areas. Such inholdings cause serious administrative and management problems. At the present time, the authority and procedures available to BLM to make exchanges to solve these problems have serious limitations in that the Bureau cannot use money to equalize values in land nor can it trade or acquire interests in land.

Concepts and Recommendations

BLM should consider in a comprehensive plan for the California Desert those key withdrawn areas with high recreation values that are needed for recreation uses and estimate the funds and manpower necessary to clear the land of ordnance and unauthorized use. Such estimates should be incorporated in budget requests implementing the Bureau's programs in these areas.

Legislative authority should also be sought to expedite the judicious exchange of public and private lands for more economical and efficient administration. It seems reasonable that others having jurisdiction over inholdings in areas designated as Recreation Lands in the desert would gain the same advantages as BLM if their lands were in contiguous blocks or located in areas where the owners could better administer, manage, utilize, or develop the land. The authority to expedite these exchanges should include the use of money to equalize values in land, as well as the acquisition and exchange of interest in land.

E. VISUAL POLLUTION

Present Situation

Visual pollution of the California Desert scenery continues as man's activities on the desert accelerate. Concealment is difficult and scars heal slowly in a desert environment. Much of this visual pollution cannot be erased in our time; however, the continuing pace of visual pollution can be slowed or halted.

Roadways or utility lines seem to be everywhere; mineral exploration frequently pays no attention to the appearance of the desert, leaving unsightly scars in profusion; home tracts with measured rows of houses, shacks, and shanties cross the desert around the outskirts of communities; litter and trash are strewn along the roads or impaled on the desert vegetation; operations of community dumps scatter more litter and trash; immense areas of the desert are grooved and scratched by past military maneuvers; signs of all descriptions proliferate; vegetation is ripped out or destroyed.

Concepts and Recommendations

On Public Domain lands in the California Desert, the Bureau of Land Management should increasingly concern itself with the problem of visual pollution and should consider the visual aspects of the desert in connections with all uses of the area. Where regulations or procedures to control uses that detract from the appearance of the desert exist, emphasis ought to be placed on enforcement. Where such regulations do not exist, and are needed, they should be sought.

Utility rights-of-way should not be scattered in a haphazard pattern across the desert. Rather, corridors, where feasible, should be established and rights-of-way granted on the basis that the utility developments be confined to those corridors.

Detailed land use planning would be required in Public Domain areas designated as Recreation Lands. Scenic corridors along interstate highways and roads in the Recreation Roads system would require special attention concerning the relationships between the mineral values and natural, recreational, and aesthetic values of the area.

Where aesthetic values are high and the terrain and other circumstances require scenic corridors and areas, they should be established. In establishing such areas, BLM should work in close cooperation with the mining industry, state and local highway agencies, and other Federal agencies. In these areas, protective withdrawals or segregations may be necessary.

Guarantees by the mining interests that prospecting and mineral development can be carried out under plans that protect the desert environment may be a reasonable alternative. To facilitate a full evaluation of mineral prospecting activity and sound land use planning, a Federal mining claim recording statute is needed.

Through cooperation with county planning commissions, buildings and sanitary codes relating to desert home tracts should be enforced revised so that they are enforceable. For example, methods such as a cluster or oasis type of development should be considered in desert home tracts. This would leave much of the land unscathed and would reduce the cost of street and utility installations as well as police, fire, and other public services.

When BLM provides areas for needed public local facilities on Public Domain lands in the desert, Special Land Use Permits should contain stringent stipulations to protect the appearance of the desert, and these should be strictly enforced. This especially concerns those permits dealing with dumps and roadside or other signs. Future military maneuvers on the desert should be confined to the existing and extensive military reservations in the area.

In future planning, emphasis should be placed on maintaining the aesthetics of natural vegetation on Public Domain areas designated as Recreation Lands and along recreation roads and interstate highways.

F. DESERT PROTECTION

Present Situation

Adequate rules and regulations are lacking to protect people and resources on public land. People and motor vehicles cannot be expeditiously controlled where they threaten or disturb public land resources or uses. Generally, a violator cannot be punished except where he causes damage to public land resources or improvements, and then, only after lengthy court proceedings. There is no legislative authority which permits expeditious enforcement of rules and regulations. Other tools of protection such as cooperation between management and user, education programs, publicity, signs, and other management aids have not been fully utilized.

Serious use clashes have occurred. Some motorcyclists and off-road vehicle drivers have demonstrated a complete disregard for the property rights of others. Fences are cut. Cattle are run with loss of weight. Lambing ewes are disturbed, causing lambs to be "bummed". The financial loss to the owner must be considered. While more difficult to prove, the deleterious effects a few "Sports" can exert on wildlife can well be visualized. Motorists have been known to have raced through quail nesting areas at about the time of hatch. Deliberate or not, the actions were seriously destructive to bird life.

The same disregard of natural and cultural resources has been amply demonstrated by vandalism, trespass, and littering. The evidence is out there on the desert.

Concepts and Recommendations

It is imperative that the California Desert recreation resource be brought under immediate protection if inherent recreation values and the potential of the desert for such purposes are to be conserved. With the recommended identification, development, and management program, recreation use of the desert can easily provide for 50 million visitor days in about 30 years. By 1980, even without development or identification of areas having recreation potential, annual use of Public Domain lands in the desert will increase from the present 4.9 million visitor days to nearly 8 million visitor days.

It does not take too much imagination to see what the desert will be like without resource protection. Discarded paper and cans from one lunch during each visit will soon turn the desert into a garbage heap. Souvenir or hobby collection of one petroglyph, chunk of petrified wood, or plant by each visitor will strip the desert bare in short order. Indiscriminate off-road meandering across the desert by motorists will severely scar the land's beauty and endanger legitimate uses and values.

Some of these abuses already exist. Legislative authority to enable expeditious enforcement of rules and regulations needed for the protection of resources is mandatory. The Bureau of Land Management should seek such legislative authority which should include provisions whereby violations of rules and regulations are deemed petty offenses and are punishable as such. The required legislative authority should provide that any person charged with the violation of such rules and regulations may be tried and sentenced by a United States Commissioner. This latter provision is necessary because of the serious difficulty of prosecuting a State or Federal law violation in State or Federal Court due to heavy workloads of these courts. The United States Forest Service was faced with this problem prior to enactment of such legislation in August 1964 (16 USC 551). Legislation applicable to the Bureau of Land Management could read as follows:

> The Secretary of Interior shall make provisions for the protection against destruction by depredation and fire upon the public lands administered by the Bureau of Land Management, and he may make such rules and regulations and establish such service as will insure the objectives of multiple use management, namely, to regulate public lands occupancy and use and to preserve the resources thereon from destruction; and any violation of the provisions of such rules and regulations shall be punished by a fine of not more than $500 or imprisonment for not more than six months, or both. Any person charged with the violation of such rules and regulations may be tried and sentenced by any United States Commissioner specially designated for that purpose by the court by which he was appointed, in the same manner and subject to the same conditions as provided for in section 3401(b)-(e) of Title 18.

Arresting authority is not required. Bureau employees, as well as permittees and licensees, could take the required action to identify the violation and violator. The preparation of an affidavit as to violation facts by the Bureau presented to the United States Commissioner would cause the Commissioner to request the presence in Court of the violator. Failure to appear would result in the violator's arrest by a U. S. Marshall.

Adequate rules and regulations to prescribe the proper use, management, government, and protection of and maintenance of good order in the recreation sites and areas administered by BLM are lacking. Such rules and regulations are urgently needed, particularly as they relate to temporary, permanent, and emergency closures of land where people and such resources as domestic stock, wildlife, special biologic communities, and historical or archeological sites may be disturbed or threatened.

For quick reference and use, rules and regulations adopted should be categorized in groupings such as sanitation, public behavior, audio devices, camping, vehicles, aircraft, and fires. Illustrated below is a recommended format with a few examples of rules and regulations pertaining to each. This listing is for illustrative purposes only, and is far from complete.

Prohibited Acts

Sanitation
1. Disposal of garbage and other refuse or wastes except where designated.
2. Polluting water supplies.

Public Behavior
1. Destroying, damaging, injuring, disturbing, defacing, or removing any natural feature, fossil, historical remains, artifact, petroglyph, special biologic community, scientific area, vegetation, wildlife, and livestock, except as permitted by law or regulation. Emergency, temporary, or permanent area closures are required in certain areas where large numbers of persons and/or motor vehicles threaten damage or injury to resources or authorized uses.
2. Destroying, injuring, defacing, removing, or disturbing any building, sign, equipment, marker, or other structure or property.
3. Discharging firearms within 1/2 mile of developed recreation sites.

Audio Devices
1. Operating or using any audio device to unreasonably annoy other persons.
2. Unauthorized use of public address systems.

Camping
1. Camping in excess of posted time limit.
2. Disturbing the peace.

Vehicles
1. Operating motor vehicles in excess of posted speeds.
2. Operating motor vehicles off highway in such a manner as to damage, or threaten damage to, vegetation, livestock, wildlife, or other resources on Public Domain lands.

3. Operating motor vehicles off roads in an area which has been officially closed to such entry, permanently or temporarily, to protect livestock or wildlife, or for any reason deemed sufficient to warrant such action.

Aircraft
1. Developing unauthorized aircraft runways.

2. Landing aircraft in unauthorized areas.

Fire

1. Building campfires in areas designated as "High Fire Danger".
2. Failure to have or abide by campfire permit where required.

Once the suggested legislative authority was obtained and the necessary rules and regulations were adopted, patterns of cooperation between management and user, educational programs, publicity, signs, and other management aids could be developed and effectively used.

G. PUBLIC CONTACT AND SURVEILLANCE

Present Situation

On a day to day basis, the Bureau of Land Management has only a limited number of field personnel to assist the public and provide surveillance over the Public Domain lands. Accidents, trespass, and illegal activities may go undetected. Opportunities to assist the desert visitor and perhaps to prevent a tragedy go unheeded. No one is on regular patrol duty to provide these vital services.

With all of its stark beauty, the desert can be harsh and inhospitable. The mute testimony of persons lost in intolerable heat, without water, is neither pleasant to contemplate nor to behold. Such cases do occur, however, through accident or ignorance as the uninitiated venture farther and farther onto unfamiliar lands with a blind reliance on mechanized equipment.

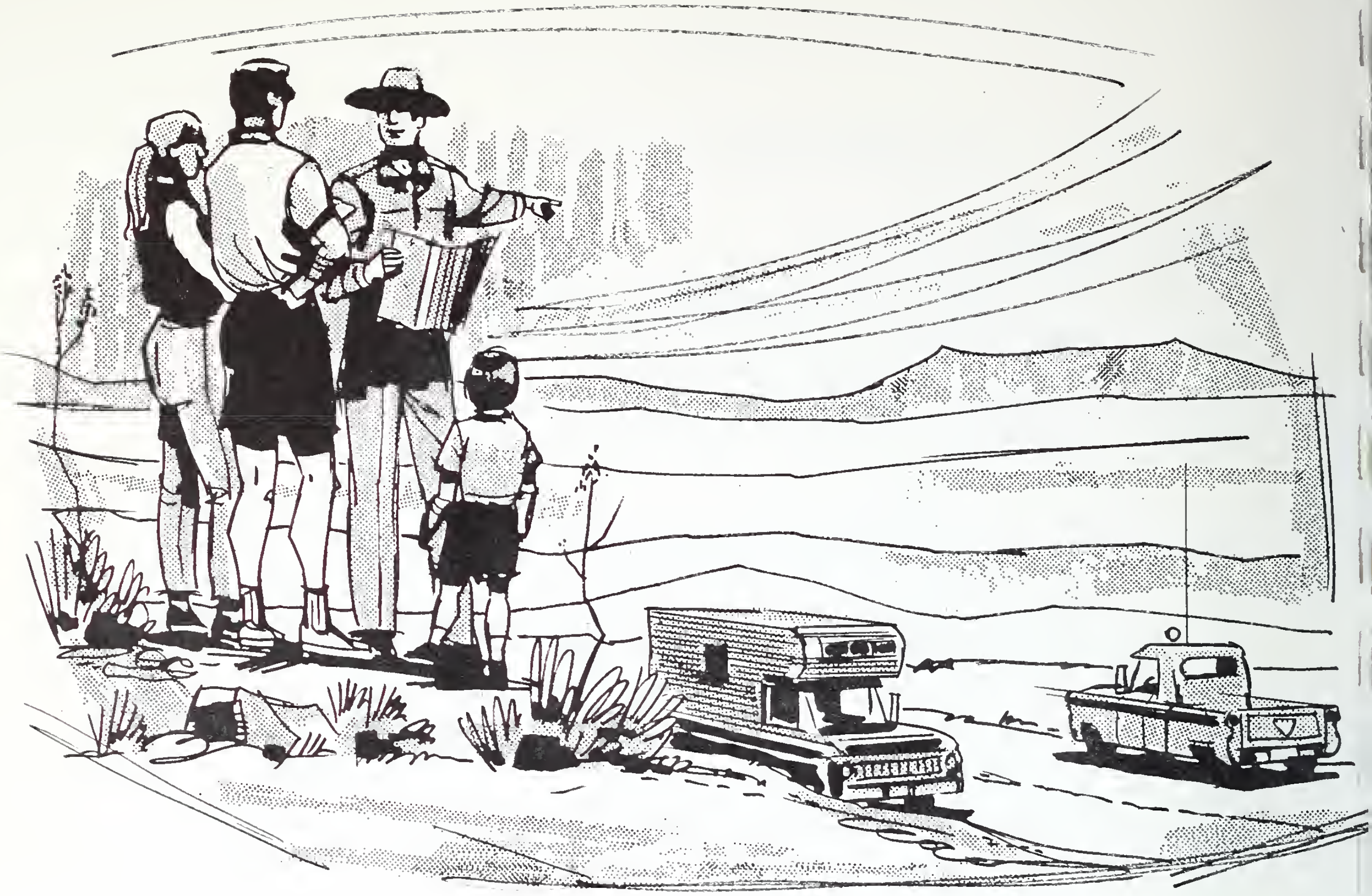
Abuse also occurs, both to the natural and scientific features and to the facilities provided for creature comfort by the Government. Sometimes it takes the form of malicious mischief in the defacement or destruction of a building. At other times, it is an innocent trespass or rape of a natural value. Regardless of motive, the end result is the same. . .destruction of a resource.

The entire concept of multiple-use depends on appreciation of values and on a mutual respect for the rights of the other varieties of users. Motorcycles should not be used to frighten cattle or wildlife.

Grazing or speculative mining need not destroy the most spectacular of desert scenery. The possible combinations of conflicts in multiple-use is almost endless.

Yet, there is a deep faith that, properly managed, multiple-use will work. But to expect that it will be self-operating, without the advantage of day to day, on site observation and assistance, approaches the zenith of optimism.

In short, the traditional land managing responsibilities of the BLM have, through Public Demand and the Classification and Multiple Use Act, been expanded to include a new and equally important dimension. . . people management. To properly discharge this dual responsibility and to successfully perform in its new role, BLM should critically analyze its organizational structure and gear to future requirements.



"THE BUREAU OF LAND MANAGEMENT SHOULD RECRUIT AND TRAIN QUALIFIED INDIVIDUALS AS UNIFORMED RANGERS SO THAT PUBLIC SERVICES AND SURVEILLANCE ARE AVAILABLE ON A SEVEN DAY BASIS."

CALIFORNIA DESERT STUDY 1968

PUBLIC CONTACT

Concepts and Recommendations

It is recommended that BLM recruit and train qualified individuals as uniformed rangers, as soon as possible. Simultaneously with this recruitment and training, geographic areas of responsibility, or Ranger Subdistricts, should be designated within the existing BLM areas. The ranger force should be augmented in a timely fashion so that public services and surveillance would be available on a seven day basis in areas of considerable activity. An adequate ranger force should be provided prior to the construction of additional recreation facilities to insure maintenance and protection.

In their daily operations, Rangers should be readily available to the public and directly responsible for a geographic portion of Public Domain lands, usually a subdivision of the present BLM so called "management area". They should be answerable to the Area Manager, as his "eyes and ears" in the field.

Individuals selected for these positions should become well acquainted with the areas so that varied assistance could be provided the public. They should be trained in first aid and search and rescue and should be provided with properly equipped patrol vehicles. Because of the great distances on the desert and public safety requirements, a complete radio communication system for BLM is essential.

In order to anticipate undesirable or illegal activities, Ranger personnel should be thoroughly versed in BLM policy, rules, and regulations. In addition, they should develop an awareness of BLM programs so field observations of changing conditions can be utilized in the development and implementation of agency programs.

If at all possible, the ranger would live in a community conveniently located to his area of responsibility. The community should have rental or sale housing, communication facilities, and at least minimal family services. Use of existing housing would eliminate the need for expensive construction and maintenance of housing facilities by the BLM. Association with a community would also assist BLM in developing a spirit of cooperation with local residents and in acquainting them with its responsibilities and program for the management of the Public Domain land resources.

H. RECREATION DEVELOPMENT

Present Situation

A majority of the recreation use in the California Desert is quite casual. Hopefully, the visitor can continue to enjoy the unique opportunities on the desert for solitude, adventure, and separation. However, because of the many people now seeking recreation there, the need for formal facilities has risen sharply. The Bureau of Land Management is currently constructing campgrounds and picnic areas in key use areas in response to this demand.

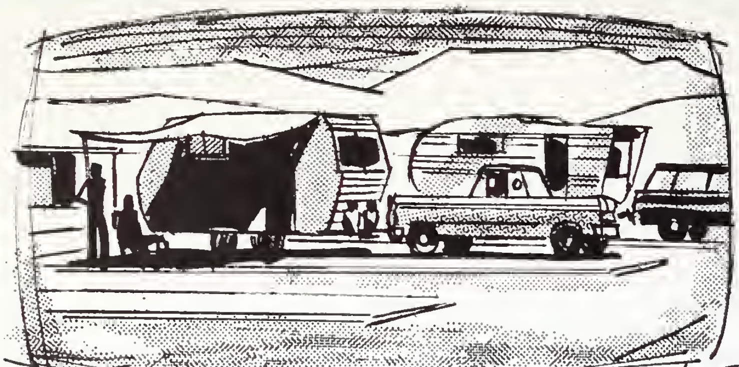
Concepts and Recommendations

Since campers and trailers are used by the majority of the visitors, recreation planning should reflect this use by the construction of more prepared parking spaces with less proportionate investment in tables and grates. Many campers now carry such cooking and eating equipment with them, so the need for the Government to supply it is lessening.

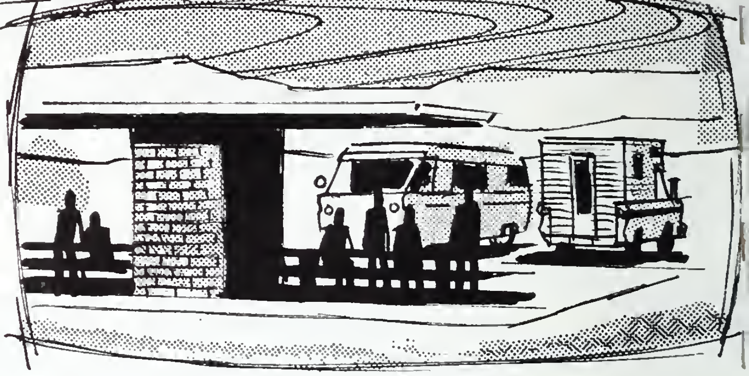
Maximum utilization of planned recreation facilities with minimal personnel should be obtained by use of the separated campground which reflects the type of transportation used by the recreationists. The following illustration suggest the purposes of a separated campground. These campgrounds, through appropriate signing, would provide separate areas for 1) campers or motor homes, 2) trailers and 3) tents or bed rolls. The first two areas would provide well delineated parking spaces tailored for the camper or motor home and the trailer, the difference being in the length of the parking space, with longer turning radii in the trailer area. No tables or grates would be provided. The tent or bed roll camping area would exclude, by natural or man-made obstacles, all types of vehicles. A common parking area would be provided, as well as tables and grates at each family or group unit. These areas, or similarly designed areas, would also be available to picnickers.

To lessen the impact on highly scenic or particularly fragile areas, camping should not be permitted there. Rather, artificial campgrounds should be built at a distance somewhat removed from the area to be protected. This would be along the means of access, be it road or trail, to the area. Thus, the convenience of the visitor would be served at the same time a prime natural resource is spared the damage of adverse overuse.

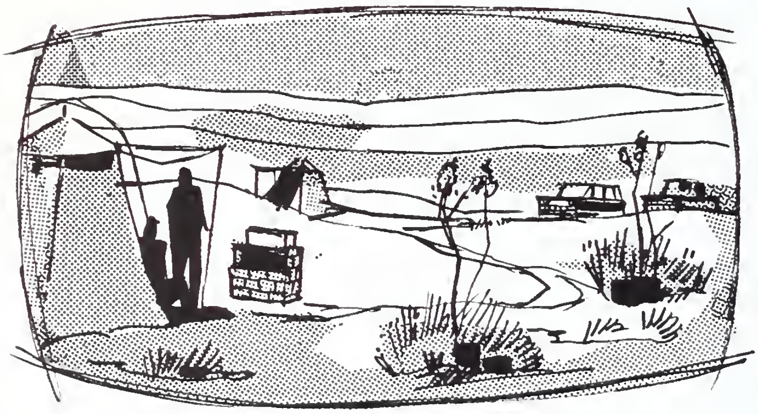
Although the availability of water is a factor to be considered, the modern camper or trailer usually carries an adequate supply. Water would also be available at all Way Stations, as described in Concept and



VEHICLE-TRAILER OVERNIGHT ACCOMMODATIONS

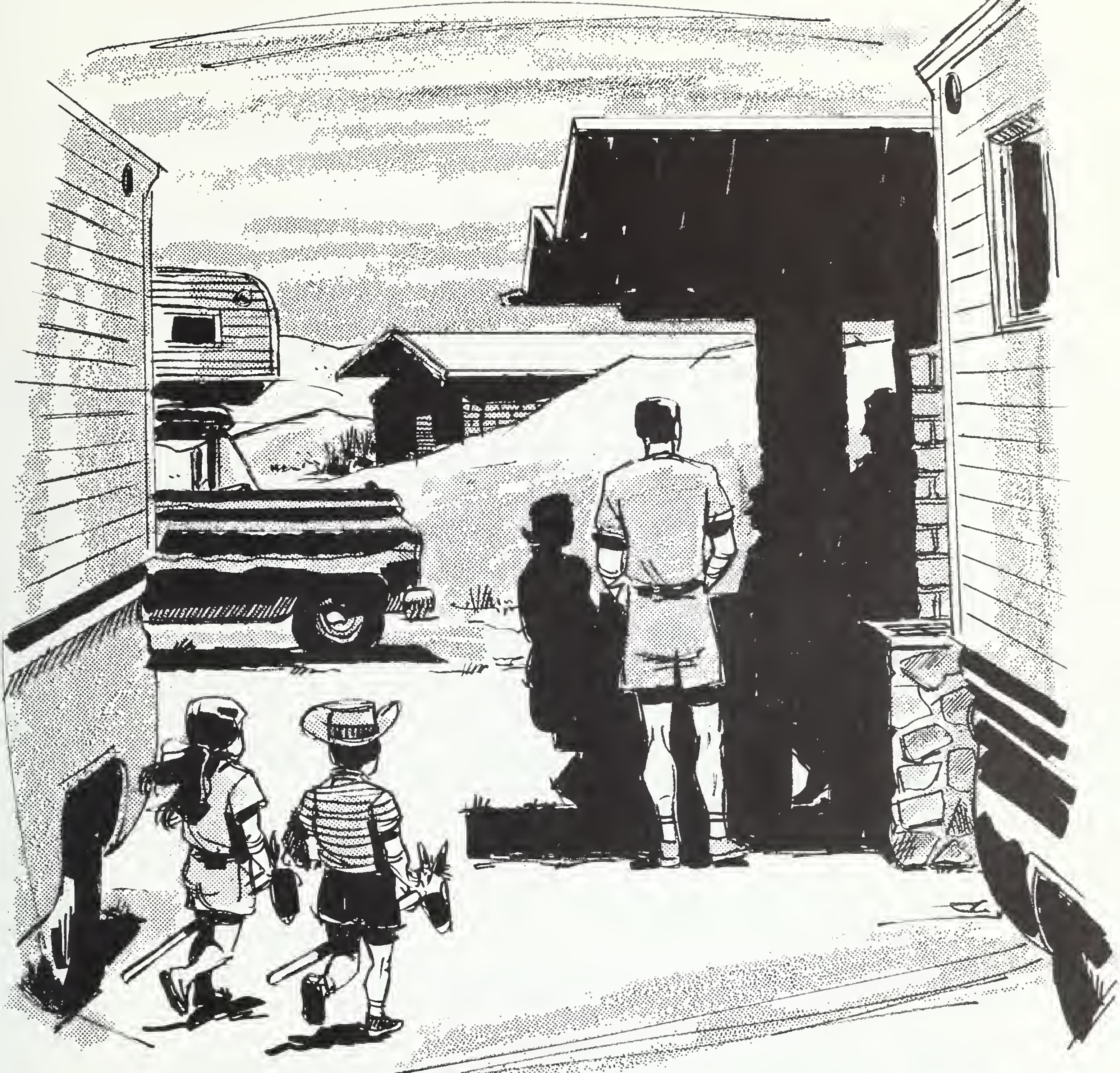


PICKUP-CAMPER—MOTOR-HOME OVERNIGHT ACCOMMODATIONS

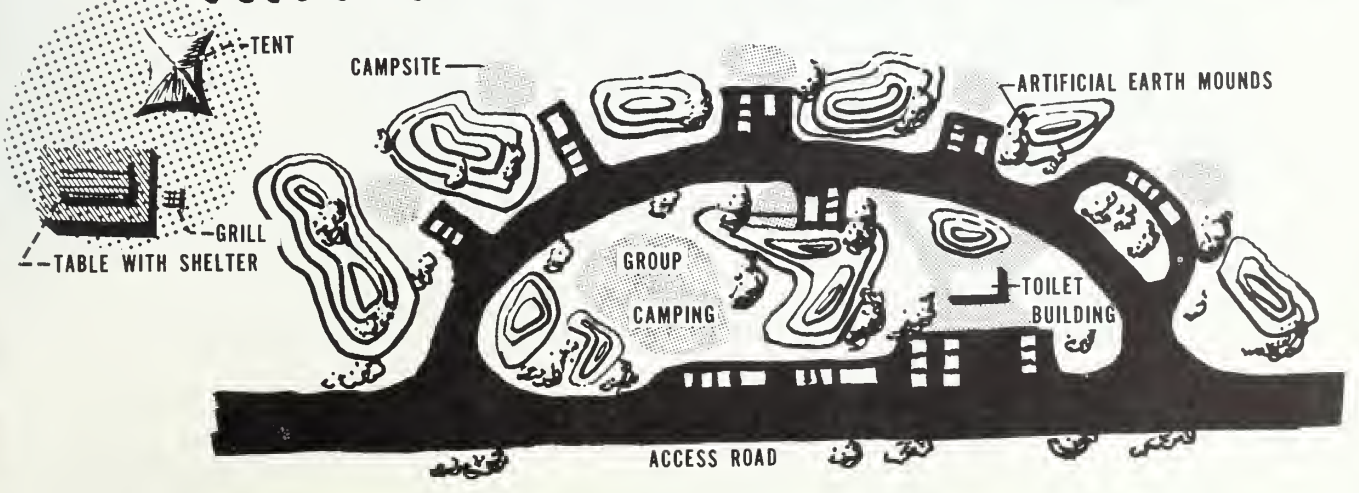


TENT WALK-IN CAMPING

SEPARATED CAMPING



ARTIFICIAL CAMPGROUND


TENT
CAMPSITE
ARTIFICIAL EARTH MOUNDS
GRILL
TABLE WITH SHELTER
GROUP CAMPING
TOILET BUILDING
ACCESS ROAD

Recommendation "I" of this study. However, when development sites are adjacent to natural water supplies, access to the water should be provided for wildlife and stock.

Stock, where bothersome, should be fenced out of developed recreation sites, in the interest of visitor safety and as a protection to the animals themselves. In order to preserve the values of solitude, adventure, and separation in the desert, camping should be permitted in other than formal campgrounds so long as it does not conflict with other multiple uses or endanger natural or scientific values. To promote area cleanliness and sanitation, trash receptacles and sanitary facilities should be provided at central locations and at reasonable intervals along the more popularly traveled roads. These would serve casual campers and participants in other approved recreational activities. Back country remote area or wilderness campers and hikers should be encouraged by educational programs and appropriate signs to carry out their trash and to use the facilities that have been provided.

Visitor safety is a prime consideration at all times, and the back country or wilderness explorer, be he camper, hiker, or off-road motorist, is particularly vulnerable. The seriousness of any accident is multiplied by his distance from civilization or help. As a public service to this type of user, BLM should initiate, just as soon as facilities and personnel permit, a voluntary registration system which would indicate the visitor's identity, destination, and proposed date of return. This information is invaluable in recognizing when a person is overdue and in providing direction to search and rescue efforts. This simple device would also add immeasurably to the visitor's peace of mind and enjoyment of the recreation he seeks in solitude.

I. VISITOR SERVICES - DESERT CENTER AND WAY STATIONS

Present Situation

The Bureau of Land Management does not have field stations to assist the general public in using the California Desert or to provide for creature comfort and safety. On-site public contact is virtually nonexistent.

In spite of the present substantial visitation to the California Desert, by and large, general public attention has not been drawn to the responsibilities of BLM and the inherent values of the desert Public Domain lands, including the many recreational opportunities there. BLM has little opportunity to assist the visitor on-site, mainly because the agency has no facilities or buildings on the desert which can serve as a base of operations. There is a real public need for desert oriented information and advice and an environmental conservation program on desert values.

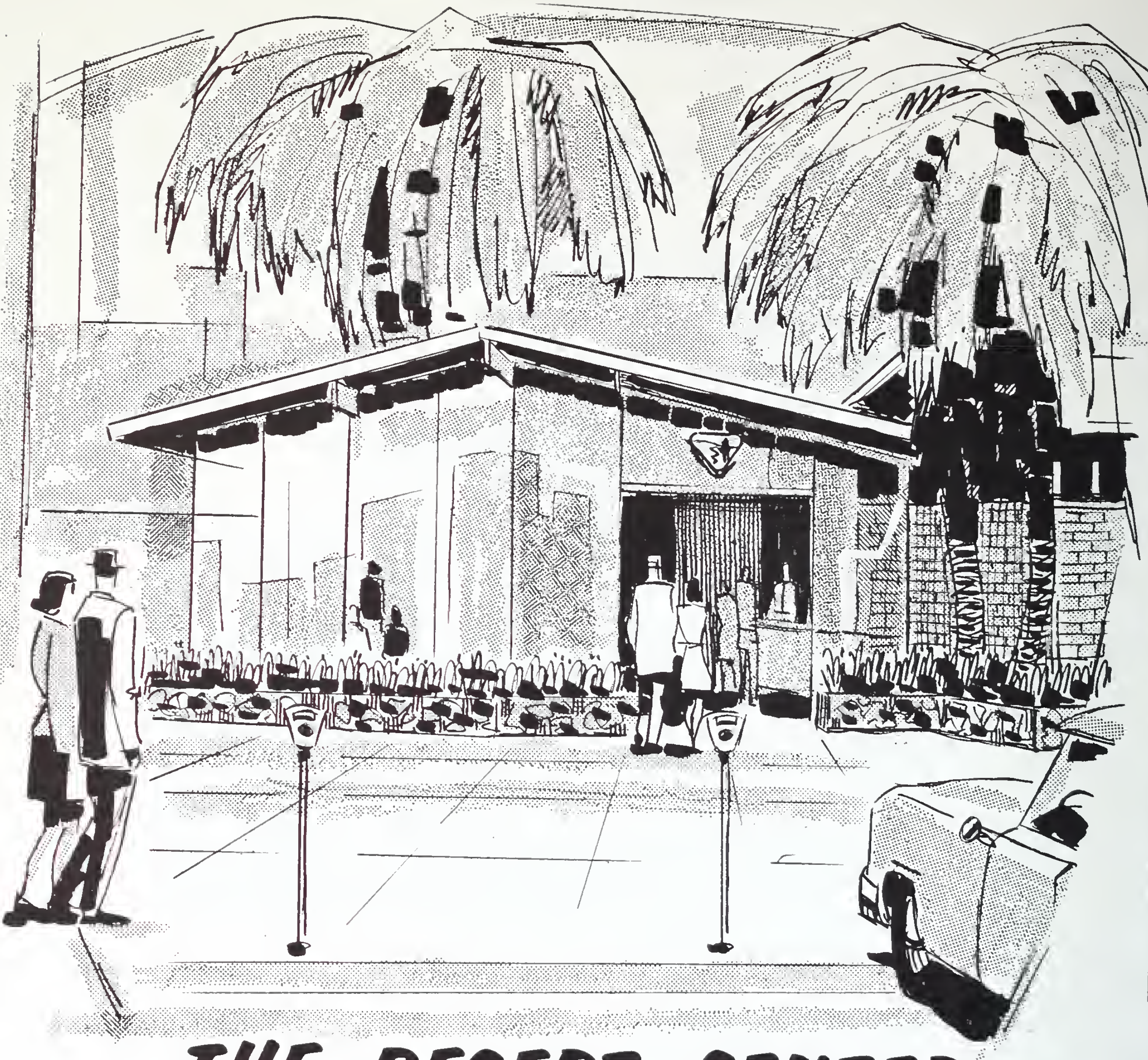
This lack of public contact was appropriate in the past, since BLM was a land managing agency, with little or no involvement in managing people engaged in recreational pursuits. However, the demand for Public Domain lands for recreation has drastically changed all this. BLM needs new tools to handle its new responsibilities.

Concepts and Recommendations

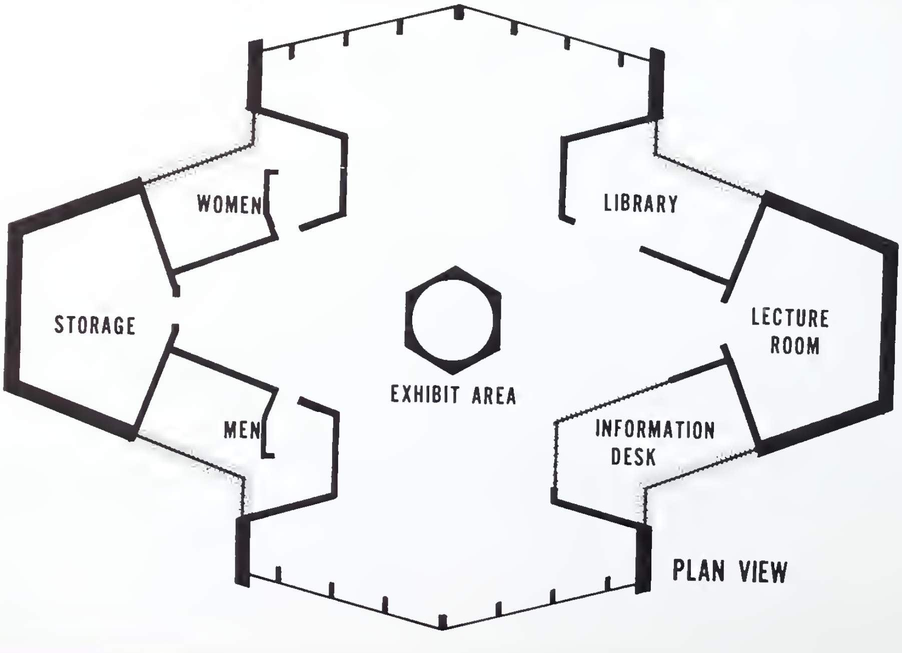
To provide assistance to the public, it is recommended that BLM plan, program, construct, and operate a Desert Center and a system of Way Stations.

The Desert Center should be a special purpose facility to serve the major population areas immediately to the west of the California Desert, which exert a tremendous influence on its use. These areas are the principal source of the increasing number of recreationists enjoying the desert. It is important to reach these people to inform them of the diverse recreation opportunities on the desert, to alert them to the hazards there, and to advise them of BLM responsibilities and public services on Public Domain lands. To best accomplish this, the Desert Center should be located near the intersection of Interstates 10 and 15 between the cities of San Bernardino and Riverside. This location would be convenient to both cities as well as to the recreationist going to the desert from the larger Los Angeles metropolitan area.

The Desert Center should be an attractive, public service building and containing a large relief map of the desert region as well as



THE DESERT CENTER

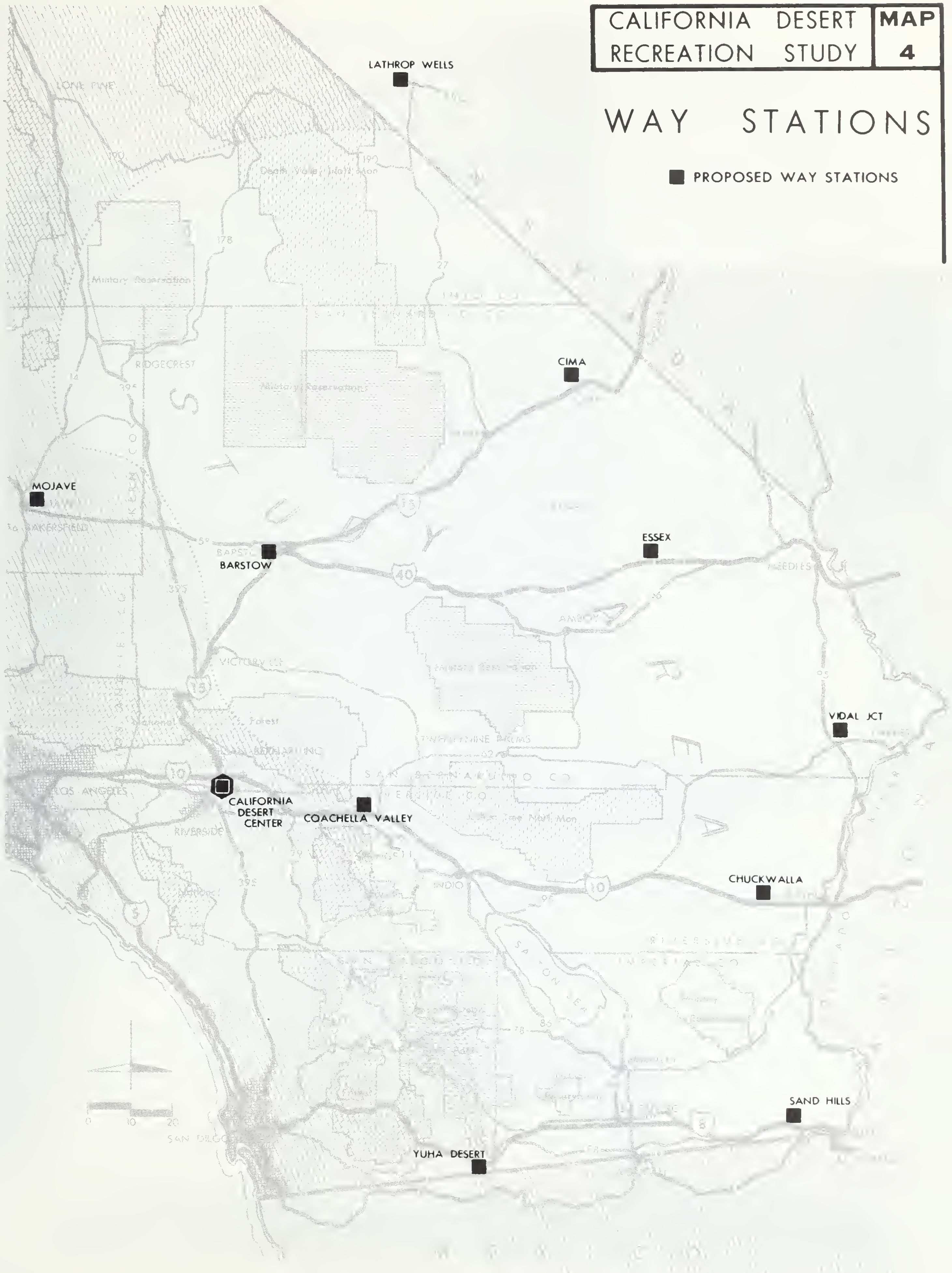

WOMEN
LIBRARY
STORAGE
LECTURE ROOM
EXHIBIT AREA
MEN
INFORMATION DESK

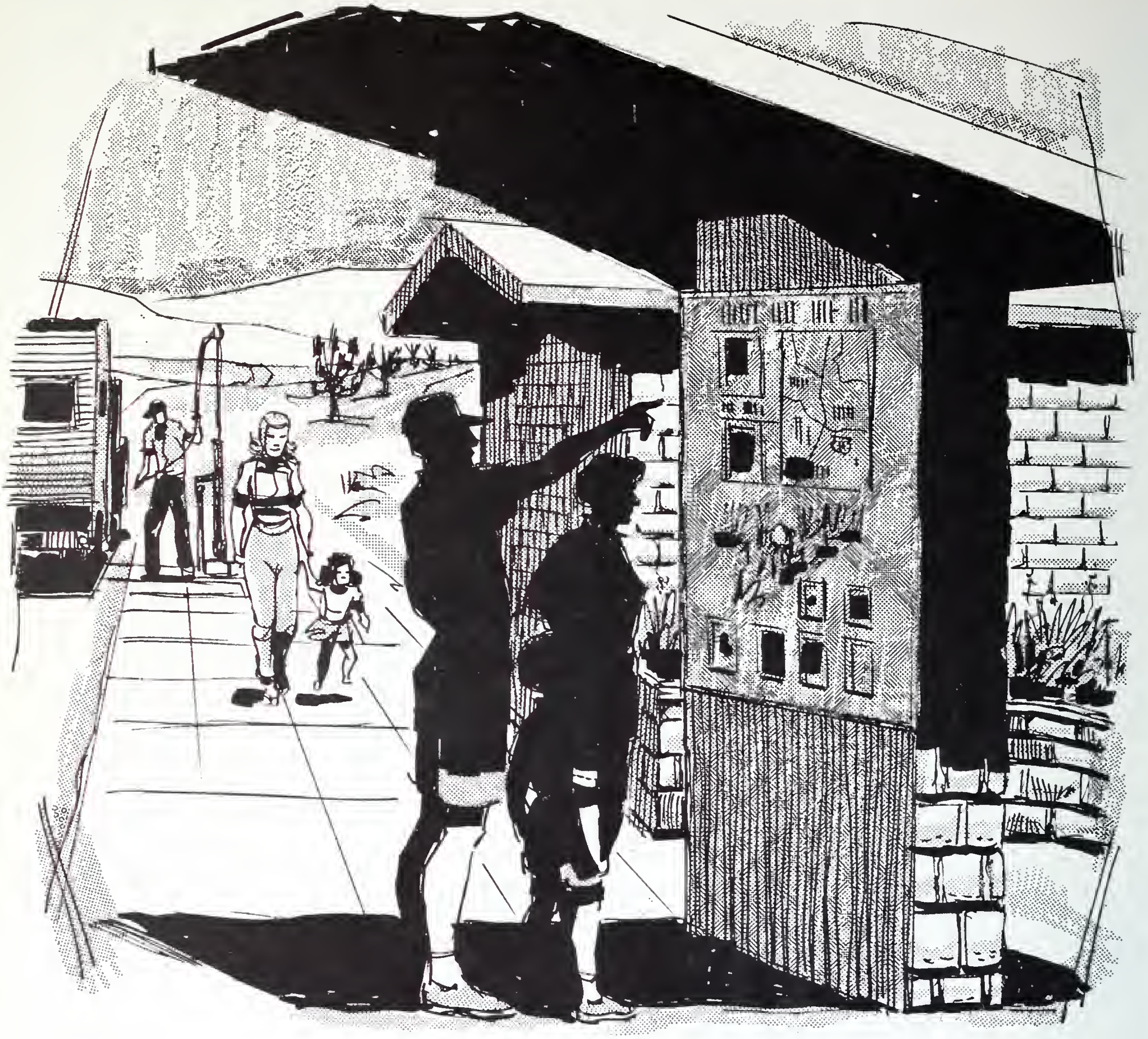
PLAN VIEW

CALIFORNIA DESERT RECREATION STUDY

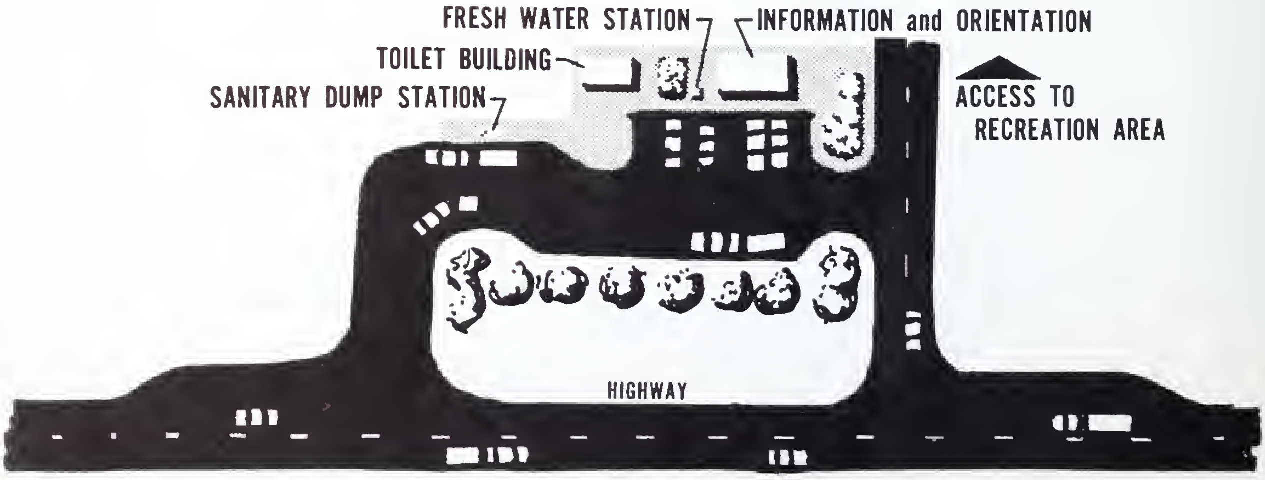
MAP 4

WAY STATIONS


■ PROPOSED WAY STATIONS
LATHROP WELLS
CIMA
MOJAVE
BARSTOW
ESSEX
VIDAL JCT
CALIFORNIA DESERT CENTER
COACHELLA VALLEY
CHUCKWALLA
SAND HILLS
YUHA DESERT
LONE PINE
Death Valley Nat'l Mon
Military Reservation
RIDGECREST
BAKERSFIELD
NEEDLES
AMBOY
VICTORVILLE
LOS ANGELES
RIVERSIDE
INDIO
SAN DIEGO
SALTON SEA
Joshua Tree Nat'l Mon
TWENTYNINE PALMS
SAN BERNARDINO CO
RIVERSIDE CO
IMPERIAL CO
STUDY AREA
15
40
10
395
8
5
0
10
20



BASIC WAY STATION


FRESH WATER STATION
INFORMATION and ORIENTATION
TOILET BUILDING
SANITARY DUMP STATION
ACCESS TO RECREATION AREA
HIGHWAY

exhibits, showing animals, birds, plant life, artifacts, fossils, etc. It should otherwise explain the geological features, the fragility of the desert, its ecology, history, and other germane subjects of general interest. An extensive selection of informational materials and brochures should also be available to the public there. In addition to this role as a visitor information and education center, the facility should perform another very important service as the hub of a desert environmental conservation program for schools and youth groups.

The Way Stations should be strategically located along primary or interstate highways in the California Desert, preferably at major intersections. The preceding map indicates a proposed system of Way Stations relative to the study area.

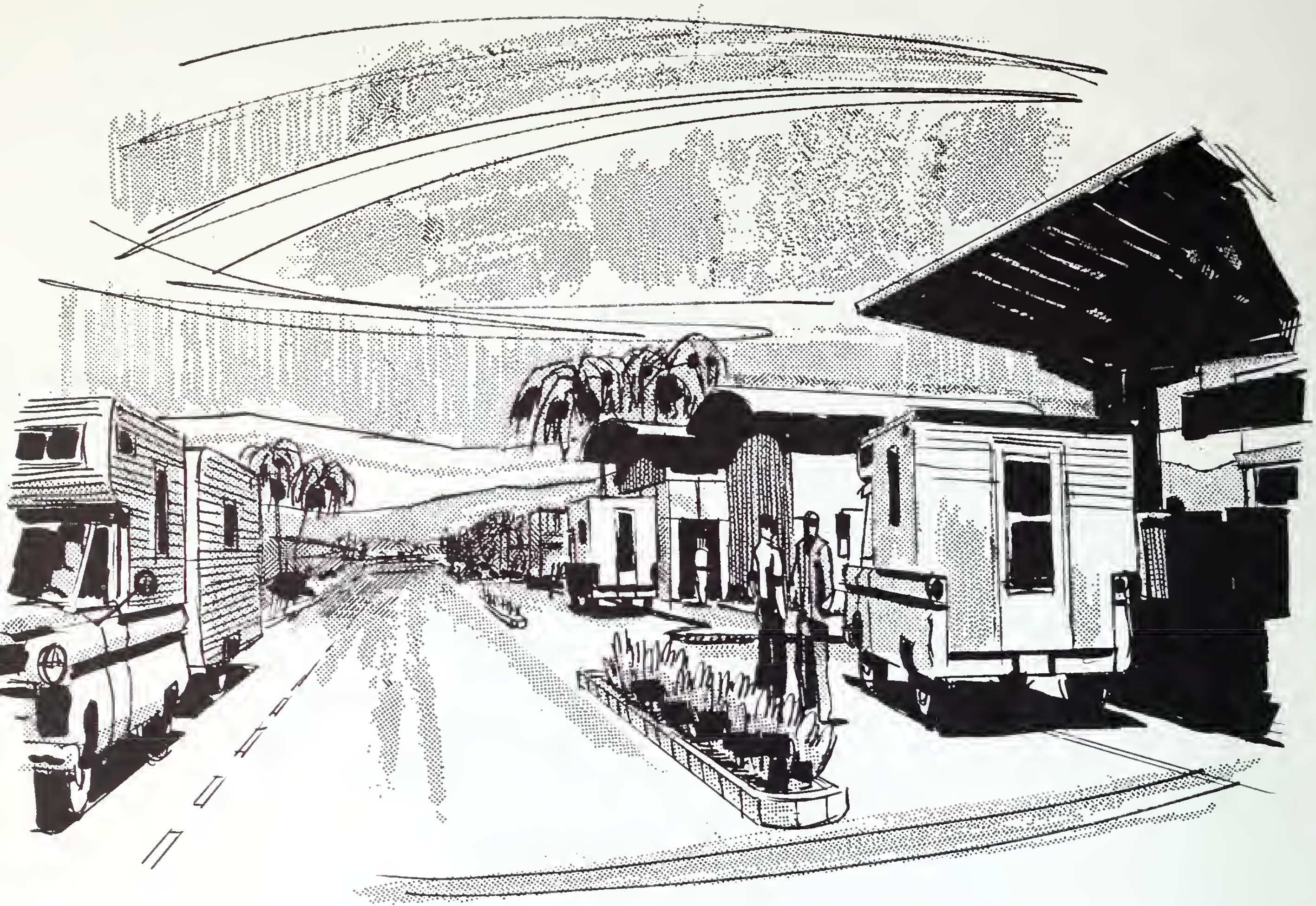
A basic Way Station, as the name implies, would provide for the basic needs of the visitor. This would include off-the-road parking, sanitary facilities, drinking water, and trash receptacles. In addition, a structure should be provided for displaying pertinent information, such as maps, directions to recreation developments, location of sites of public interest, and regulations. Since campers and trailers are increasingly preferred by the recreationist in the desert, sanitary disposal stations should be provided too. Except for visits by the ranger or maintenance man, the basic Way Station would not be manned.

A complete Way Station, the refinement of the basic Way Station, envisions extensive complexes, shared by BLM and private enterprise. The facilities associated with a basic station would be upgraded at the complete Way Station as the need arises. The structure for displaying pertinent information would be replaced by a building. The station should be manned and more elaborate or detailed information, as well as first aid and rescue services, made available to the public. Overnight camping and wayside picnic facilities are appropriate public services of the complex.

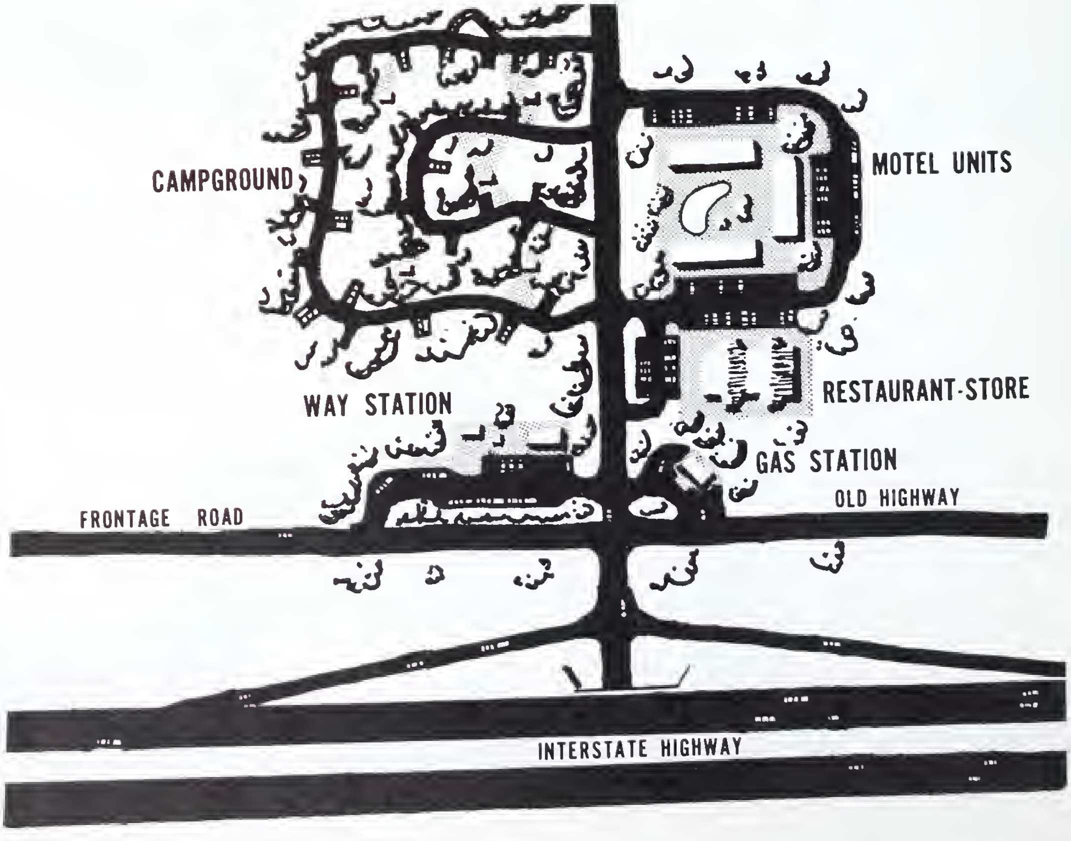
Complete Way Stations should generally be located along major or interstate highways, so local businessmen, restaurant and motel chains, and oil companies would, more than likely, be interested in sharing these sites with BLM. Restaurants, motels, and gas stations provided by private enterprise could greatly expand the services available to the public. Equitable arrangements should be made between the BLM and private enterprise in the development of such facilities.

The type and quality of services available at the Way Station should reflect the needs of the recreationist and the inquiries about BLM programs. Therefore, the appropriate Way Station at any given location may vary between a basic Way Station and a complete Way Station.

Each Way Station would take its name from its locality.



WAY STATION


CAMPGROUND
MOTEL UNITS
RESTAURANT-STORE
WAY STATION
GAS STATION
OLD HIGHWAY
FRONTAGE ROAD
INTERSTATE HIGHWAY

If the system is developed, BLM may find that most Way Stations are conveniently located as bases for ranger activities. The need for and location of housing for the rangers and other personnel assigned to a particular Way Station should be determined on the merits of each case.

Finally, BLM should keep the state and county highway agencies informed on plans to develop the system of Way Stations. Cooperative planning with highway agencies would give them an opportunity to consider Way Stations in the design of intersections or interchanges and the locations of highway rest stops and other facilities to serve the public.

J. CONCESSION DEVELOPMENT

Present Situation

The Bureau of Land Management does not have concessioners operating on Public Domain lands in the California Desert. However, there are small establishments on nearby private lands providing various and sundry services to the public.

Concepts and Recommendations

BLM should encourage concession developments and private investment in public recreation facilities as the need develops and where appropriate. Such encouragement would assist BLM, immeasurably, in providing desirable recreation facilities or supplementing services for the public.

Most Federal and non-Federal agencies already use this means to provide a variety of public services. In fact, many of these services, such as stores, restaurants, motels, riding facilities, marinas, etc., would not be available without private investment.

In the California Desert, a number of recreation activities need services which could be provided through facilities developed by private capital. For instance, motorcyclists or dune buggy enthusiasts need services similar to those provided for boaters at marinas--gasoline, refreshments, repair services, etc. These recreationists tend to congregate; they enjoy each other's company. It would, therefore, be possible to locate facilities to serve areas of concentration so the concessioner would have a reasonable opportunity for profit.

A sail plane (glider) facility in San Diego County serves as a good example of the possibilities of this approach. An individual has made a substantial investment in a public restaurant and overnight accommodations to promote this recreation activity and appears to be quite successful. This approach could be used for several of the existing recreation activities on Public Domain lands and should be considered as new ones become popular.

As a supplementary benefit in sparsely settled areas, the operation and maintenance of these privately financed recreation facilities would provide employment for the residents and improve the local economy.

BLM should seek the necessary legislation to formalize this program, which could well be modeled after P.L. 89-249, providing for the operation of concessions in the National Park System.

K. RECREATION ROADS AND TRAILS SYSTEMS

Present Situation

Four major interstate highways cross the California Desert in an east-west direction. There are also other excellent highways and segments of interstate highways in the northern and western portion of the area, in the Imperial Valley, and along the Colorado River. Improved county roads provide adequate access between the widely scattered communities. However, roads into and through many of the recreation areas proposed in this study are inadequate and may be negotiated only by four-wheel drive vehicles.

Motorcycle, bicycle, equestrian, and hiking trails are haphazard or nonexistent even though there is ample opportunity for such recreation and it can be pleasant and envigorating at the proper time of year.

Concepts and Recommendations

Using existing state and county roads to the extent possible, a system of recreation roads should be developed and maintained through cooperative planning with state and local governments. This system would enhance the recreational values of all lands along these roads and provide opportunities for leisurely and scenic travel through the California Desert.

For such distance as is prudent and desirable on each side of the proposed roadways, the use of Public Domain lands should be so controlled as to minimize intrusions on the natural scene. The objective is a pleasurable and leisurely drive through the beauty of an unspoiled desert.

A backdrop of grazing livestock or an orderly mining effort can arouse the traveler's interest and add to his enjoyment. To assure necessary controls, the Bureau of Land Management should retain ownership of such lands as are necessary within the right-of-way.

A liaison should be established with the local agencies involved to assure the cooperative planning and programming of construction so necessary to the success of this proposal. It is entirely possible that some of the roads may qualify to be included in the State Scenic Road System.

Considerable improvement is needed in the roadways and private roadside developments along portions of existing roads selected for this system if they are to be aesthetically attractive. Since BLM still retains, in public ownership, much of the land these recreation roads traverse, it can act to preserve the natural qualities on those portions and, perhaps, influence private owners to upgrade the quality and appearance of their properties.

The primary objective of this cooperative planning would again be to provide a leisurely route of travel with frequent opportunities to park and to enjoy the scenery and other natural, historic, and scientific values. New construction plans and proposals involving roads within this system should be directed toward alignments and cross-sections that would harmonize with the terrain, minimizing new as well as old construction scars. Curvature, pavement and shoulder widths, types of construction, and other standards and design geometrics would depend on the anticipated volume of traffic and characteristics of the terrain.

Well defined trails are needed, too, to introduce the visitor to the splendors of the desert or to provide for his specialized recreational interests. Generally speaking, these would accommodate motorcyclists, bicylists, equestrians, or hikers, and in some cases the same trail may serve more than one of these modes of travel. Sections L and N of Part III, "Concepts and Recommendations", contain additional information on these uses, as does Part IV, "Silhouettes".

The entire Public Domain in the California Desert should be considered in planning for trails to satisfy the recreational needs, at the same time avoiding conflict with other legitimate uses. Terrain and climate should be given every consideration, along with the special needs of the particular type of travel. As an example, cross-country motorcycle trails would be built to satisfy the cyclist's spirit of adventure, at the same time leading him away from areas where he may encounter livestock, disturb visitors with other interests, or destroy natural values.

The bicyclist and equestrian will wish a less demanding route, but on the other hand, would run less of a risk of disturbing other uses or users.

The hiker will require variety, from the short walk to an overlook to the endurance contest of rugged desert crossing or mountain climbing. As the ultimate in hiking use of the area, the possibility of inclusion of one or more trails in the National Trail System should be explored Several historic trails have crossed the area (see History, Part II, Section B) and serious investigations should be initiated by BLM to establish their eligibility for inclusion in the National Trail System presently under consideration by the Congress.

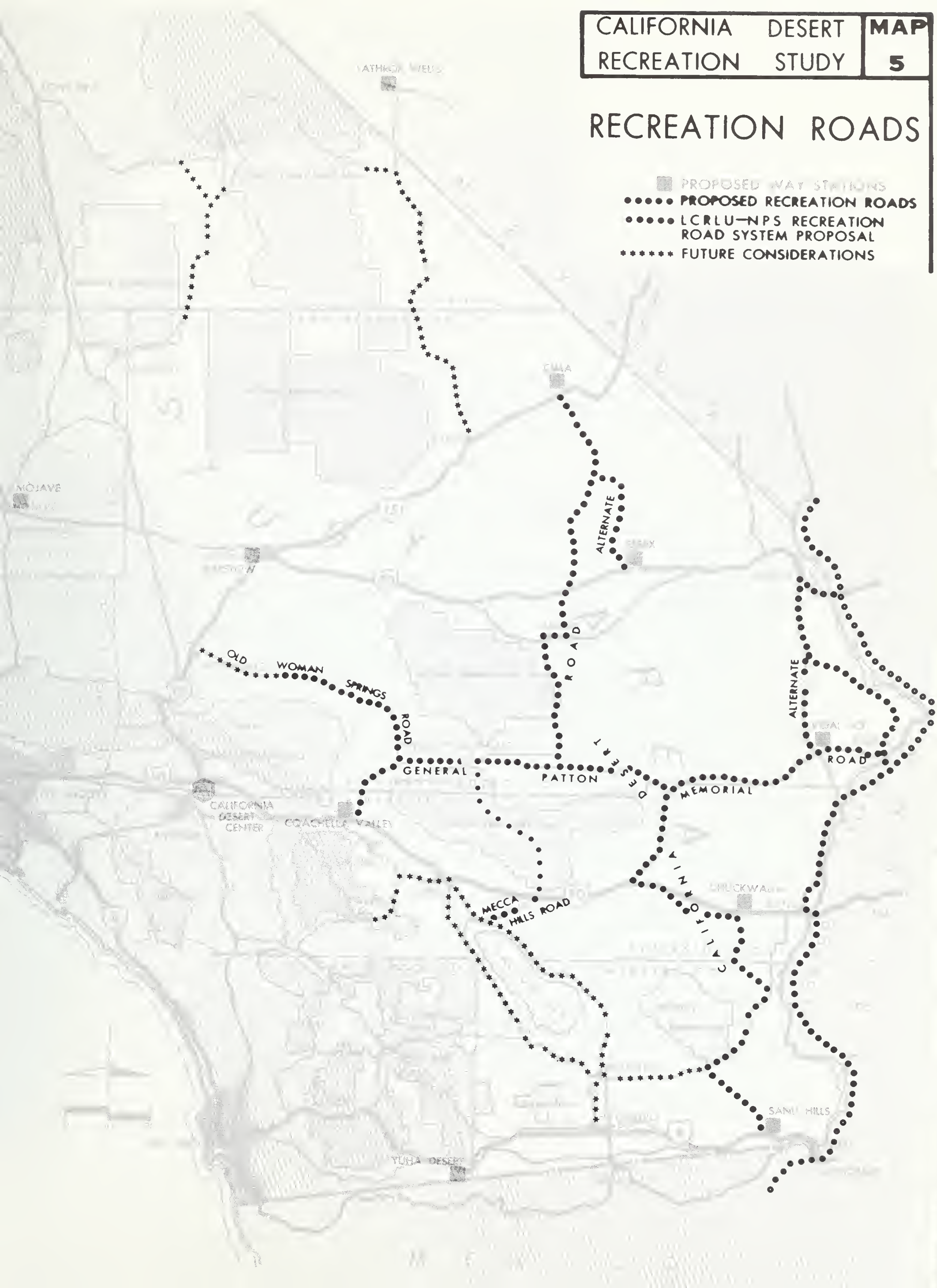
The following map delineates the proposed system of recreation roads and other existing roads that bear consideration. Time did not permit development of a detailed trail system proposal.

The California Desert Road would link four interestate highways and provide a north-south route bisecting the vast expanse of desert lands between the urban centers in western Riverside and San Bernardino

CALIFORNIA DESERT RECREATION STUDY

MAP 5

RECREATION ROADS


PROPOSED WAY STATIONS
PROPOSED RECREATION ROADS
LCRLU—NPS RECREATION ROAD SYSTEM PROPOSAL
FUTURE CONSIDERATIONS
LATHROP WELLS
CIMA
MOJAVE
BARSTOW
ALTERNATE
ESSEX
ROAD
OLD WOMAN SPRINGS ROAD
GENERAL PATTON DESERT MEMORIAL ROAD
ALTERNATE
VIDAL JCT
CALIFORNIA DESERT CENTER
COACHELLA VALLEY
MECCA HILLS ROAD
CALIFORNIA
CHUCKWALLA
SAND HILLS
YUHA DESERT

Counties, and the Colorado River. The northern terminus of this recreation road would be the proposed Cima Way Station on Interstate 15. Using existing county roads, this road would trend southward through the small communities of Cima and Kelso, and the Eastern Mojave Recreation Land area and cross the new alignment of Interstate 40 to Amboy on U. S. Highway 66. South of Amboy, existing county roads will be used to the community of Desert Center on Interstate 10. Thence, segments of Interstate 10 and U. S. Highway 60 will be used eastward to the proposed Chuckwalla Way Station on Interstate 10. At the Chuckwalla Way Station, the route would turn southward again through the Chuckwalla Recreation Land area, passing new BLM recreation developments at Wylie Well and Coon Hollow, to State Highway 78 near Midway Well. Highway 78 would be used to the small community of Glamis where the road would turn abruptly southeast through the Imperial Sand Hills Recreation Land area to the proposed Imperial Sand Hills Way Station on Interstate 8. An alternate route through the Eastern Mojave Recreation Land area would leave the California Desert Road about four miles south of the small community of Cima, follow the Old Government Road eastward for about six miles and then turn southward to the proposed Essex Way Station on the new alignment of Interstate 40.

General Patton Memorial Road would be an alternate to Interstates 10 and 40. The western terminus would be the junction of Interstate 10 and State Highway 62, about six miles east of the proposed Coachella Valley Way Station. State Highway 62 will be used eastward to Twentynine Palms. County roads would be used to the Colorado River--duplicating, en route, a portion of the California Desert Road. This route would pass a proposed Way Station at Vidal Junction and join the Lower Colorado River Land Use Office--National Park Service proposed parkway near Earp on the Colorado River. As a sidelight, the vicinity of Vidal Junction is where General Patton trained his armored divisions prior to the Allied invasion of North Africa in World War II. General Patton's mailbox still stands at Vidal Junction, painted and maintained by some patriotic individual. West of Vidal Junction, two chapels are still maintained and visited by veterans of the desert maneuvers.

Northwest and northeast of Vidal Junction lie the Turtle Mountains (Mopah Peaks) and the Whipple Mountains Recreation Land areas. U. S. Highway 95, connecting Vidal Junction with U. S. Highway 66 near Needles, passes between the two mountain masses. Also, U. S. Highway 95 may be incorporated in the proposed Lower Colorado Land Use Office--National Park Service parkway road system for an undetermined distance south of U. S. Highway 66 before the proposed parkway turns eastward to pass north and east of the Whipple Mountains. Therefore, the remainder of U. S. Highway 95 north of Vidal Junction could be designated as an alternate recreation road.

Old Woman Springs Road (Lucerne Valley to State Highway 62)

Designating this country road as a recreation road would provide an opportunity to preserve some of the natural scenery in Johnson Valley and to establish a leisurely access route to the General Patton recreation road for growing communities around Victorville.

Mecca Hills Road (extension of park road through Joshua Tree National Monument to Mecca on State Highway 111).

This road is State Highway 195 which passes through the Mecca Hills Recreation Land area. There is little disturbance of the existing scene at the present time and designation of this as a recreation road would, hopefully, preserve this condition.

Other Possible Scenic Roads

Time for this study precluded further selections of existing roads as part of a recreation road system. Supplemental studies should consider either State Highway 86 or 111 through the Coachella and Imperial Valleys; State Highway 78 between Anza-Borrego State Park and Imperial Sand Hills Recreation Land area; State Highway 18 between Victorville and Lucerne Valley; State Highway 127 northward from Baker to Death Valley National Monument; and the county road northward from Trona through the Panamint Valley to State Highway 190, or Death Valley National Monument.

L. SPECIALIZED RECREATION ACTIVITIES

Present Situation

Sightseeing, picnicking, camping, and other such generalized activities are enjoyed by a great percentage of those who use the California Desert for recreation. But these may be only a part of any one person's recreational experience. There are a multitude of specialized recreation activities that take place on the desert. Hunting, target shooting, rockhounding, archery, wilderness experiences, and many other diverse forms of recreation are important and appropriate uses of the desert land.

These specialized activities often present their own unique problems. They may require a particular kind of area with certain geologic or atmospheric conditions. . .mountain climbing or sailplane flying for example. Or they may require the presence of particular resources such as wildlife for hunting, or certain minerals for rockhounding.

In some instances today, these specialized uses conflict with other uses. Motorcyclists and wilderness hikers, hunters and bird-watchers, rockhounds and commercial mining developers, cross country motorists and livestock raisers, are not necessarily compatible. As the use of the desert intensifies, these areas of conflict come into sharper focus, and physical or verbal clashes take place. In these circumstances, the Bureau of Land Management is generally blamed by any particular user or user group for allowing the conflicting uses to interfere.

At the present time, BLM does not have the capability to provide the services needed to insure that a great variety of specialized recreation activities can be accommodated in the California Desert area without serious conflict.

Concepts and Recommendations

BLM should evaluate the existing specialized recreational uses of the California Desert, and the special provisions they may require for public enjoyment, safety, and protection of the desert environment.

Two specialized uses, off-road vehicular travel and Desert sport motorcycling, have some unique and pressing problems. They are evaluated separately and are treated specifically in Concepts and Recommendations "M" and "N" of this California Desert Study.

Other uses which are presently enjoyed by large numbers of people in the desert area should be evaluated as soon as possible, and methods of providing the special services and facilities needed should be determined and implemented.

Rockhounding is a desert use that is rapidly increasing. The participants, who are often families or small groups, are frequently well organized into clubs. This is an educational as well as a recreational activity, and should be encouraged.

However, there are those who misuse the desert resources, taking off much more material than they, themselves, can use, often for commerical purposes. Botanical specimens may suffer from this exhorbitant plunder, too. Other people remove irreplaceable geological, paleontological, or archaeological objects. BLM should seek methods to prevent this serious misuse, which, in turn, would add to the pleasure of rational visitors.

Hunting is another activity that is enjoyed by many people in the desert. Since game animals are hunted under strict regulations to insure the ample perpetuation of wildlife species, this is a resource that will provide recreation on a continuing basis. There are, however, a certain number of people who are indiscriminate shooters. These people are neither serious sportsmen nor conservationists, and unfortunately, they are responsible for the destruction of countless signs, trash barrels, and anything else they can find to shoot at. BLM should seek ways to control this misuse while allowing the careful target shooter and the sportsmanlike hunter to continue to enjoy their forms of recreation on the desert.

There are those who enjoy the desert for its unique qualities of solitude and silence. The desert can provide its own kind of wilderness experience, and BLM should investigate the possibilities of, and seek to set aside, appropriate wilderness areas in the California Desert.

BLM should investigate the possibility of a system of trails for horseback riders as well as hikers, including the development of water supplies, feed, and other equestrian facilities.

Many people enjoy driving into recreation areas on back roads, byways, and trails, often over rough terrain in four-wheel drive or other specialized vehicles. In Recreation Land areas BLM should designate such byways and trails with appropriate signs, maps, and informational material, and also provide the required services such as trash receptacles and comfort stations at key points. This would meet the needs of these motorized recreationists and, at the same time, protect the general desert environment and scenery from an endless maze of road scars and vehicle congestion.

Other forms of recreation activity that are becoming popular on the desert include: nature study and observation, distance (flight) archery shooting, sailplane (glider) flying, sand chariot sailing on dry lake beds, and rocket launching. BLM should investigate these uses and seek methods to provide services for their enjoyment; to prevent conflicts between these uses, other recreational uses, and commercial, scientific, and educational uses; and to insure the protection of the desert resources and environment.

M. FACILITIES FOR OFF-ROAD VEHICULAR RECREATION

Present Situation

Dune buggies, jeep-type vehicles and motorcycles are the major off-road vehicles currently found in the California Desert. This type of use includes those whose recreation consists of just cross-country riding as well as those who use their vehicles to reach out-of-the-way areas for other forms of recreation such as camping, hunting, or rockhounding. This type of recreation is becoming very popular and reflects considerable investment by the vehicle owners. Dune buggy enthusiasts even pursue their pastime on a year-round basis by riding the dunes in the evening or at night during the hot summer months.

The uncontrolled use of off-road vehicles has caused considerable damage to the desert environment in some areas. Except for the few Bureau of Land Management recreation developments, facilities for these recreation users do not exist, and no existing facilities adequately meet their needs. Evidence of their activity occurs almost everywhere throughout the desert. The full extent of conflict with other uses of the desert area is not known, although a preliminary study of the problem has indicated that serious losses of desert vegetation and soil problems occur as a result of excessive off-road vehicular use. Part II, Section B, "Effects of Vehicular Use on Vegetation, Soils and Watersheds" recounts the damage of desert values from such use.

Concepts and Recommendations

To encourage this popular recreation use with a minimum of damage to resources and conflict with other uses, BLM should provide developments designed specifically for off-road vehicular recreation.

Because of the nature of sand dunes, damage to the natural environment by dune buggies is minimal. However, for lack of sufficient areas to park or congregate, particularly in the Imperial Sand Hills area, these recreationists use the shoulders of the highways for their vehicles, causing a hazardous situation for themselves as well as the highway traveler. If only to alleviate these hazardous conditions, developments for this recreation activity are needed.

For example, in an area designated for dune buggy use, a central location would be surfaced. On an island, so to speak, in the middle of the surfaced area, sanitary facilities; trash receptacles; permanent or temporary installations for purchasing gasoline, refreshments, or other supplies, ramadas, or picnic shelters and possibly a playground for small children would be provided. To accommodate sufficient parking, extensions or fingers would extend from the central area. These facilities may be provided by concessioners, such as manufacturers or dealers in off-road vehicles.

The following illustration suggests a development for off-road vehicular recreation. This type of development could be used in dune areas, or wherever cross-country vehicle users congregate.

BLM should also continue studies of the effects of cross-country, off-road vehicle use on the resources of the desert. These studies should include:

A continuation of the on-site soil and vegetative studies conducted in 1968 to determine the effects of vehicle use on a cumulative basis, and at various times of the year.

Studies on the problems of wind and water erosion, and the effects of native plants in controlling it; on soil movement in watersheds with heavy vehicle use; and on maintenance measures needed to protect intensive use areas.

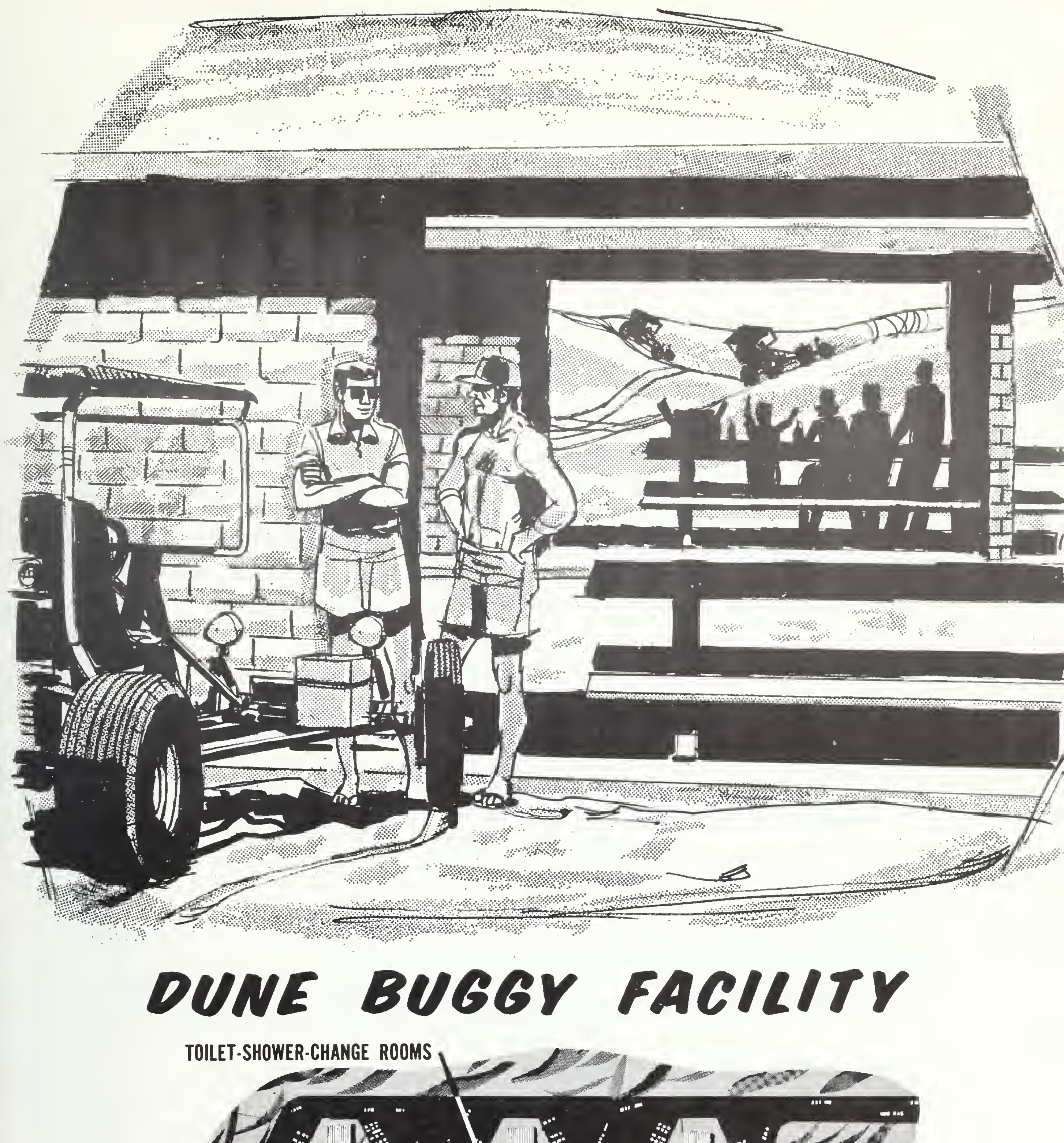
Studies on growth rates of desert plants, and on the effects of seeding versus use-closures to allow natural plant recovery.

Studies on the effects of vehicle use on desert wildlife, including the effects of gas and oil on fresh water shrimp in dry lake bed areas.

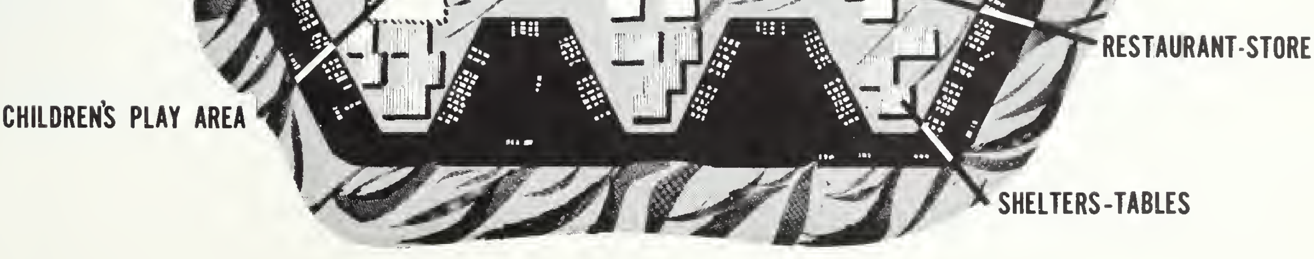
Studies of the effects of conflict between off-road vehicle users and livestock, campers, hunters, and other users of public desert lands.

As soon as possible, based on these and other needed studies, BLM should provide the required services and control measures to designate certain areas for off-road vehicular use, and to properly regulate this kind of use in areas where it has damaging effects on the desert environment; threatens important natural, scientific, historical, or recreational resources; or causes serious conflicts with other users.

"Facilities for Motorcyclists" is treated as a special subject in the next section (N) of this Part.



DUNE BUGGY FACILITY


TOILET-SHOWER-CHANGE ROOMS
RESTAURANT-STORE
CHILDREN'S PLAY AREA
SHELTERS-TABLES

N. FACILITIES FOR MOTORCYCLISTS

Present Situation

Motorcycle riding and racing is an increasingly popular type of recreation activity. Information compiled in the California Desert area in 1968 recorded over five hundred thousand visitor days of use for sport motorcycling.

Individually and collectively, participants have substantial investments in motorcycles, campers, trailers, and other gear. Large quantities of gasoline and other commodities are purchased locally or brought to the scene by the participants. Their associations are well organized and except for damage to soil and vegetation, the marshalling area and race course are generally cleaned of litter and debris after their use. More and more families are becoming involved in this sport and the "Hell's Angels" image is fading.

However, major conflicts with other users have occurred, particularly when individuals or small groups of cyclists strike out cross-country on their own. To date, these conflicts consist mainly of head-on encounters with livestock men when the cyclist is suspected of endangering the animals legitimately grazing on the range. The damage to natural values is also evident in the scarring of the desert, but here it is difficult to arrive at a monetary evaluation of the damage or to determine whether it was malicious or innocent.

Concepts and Recommendations

Motorcyclists deserve recognition, just like any other recreationist on the Public Domain lands. Since motorcycle use can be incompatible with other uses, special provisions are required to prevent damage to resources as well as conflict with other users.

The Bureau of Land Management and official representatives of the associations of motorcycle clubs should mutually select areas for motorcycle centers where damage to the land and resources is minimal, yet which provide the diversity of terrain necessary for motorcycle riding and racing. Proposed Cycle Centers are shown, as they might be developed, in the Rodman Mountains Recreation Land area Silhouette in Part IV of this Study.

A course pattern could be laid out in the Cycle Center areas which would provide the optimum use while adequately protecting the environment.

The course pattern for a Cycle Center would include a series of raceways. Each raceway would be used in a given year. A Cycle Center with four raceways would indicate a four year rotation of the raceway areas.

The center of these configurations would be the marshalling area. In the marshalling area would be a permanent facility with some sort of surface treatment, delineated areas for parking, sanitary facilities, areas for emergency equipment, portable starting gates, and other paraphernalia associated with motorcycle riding and racing. Manufacturers of motorcycles might participate in these developments as concessioners by providing permanent installations for motorcycle repair services and other accommodations such as playgrounds for children, ramadas, etc. An artist's conception of the activity associated with a marshalling area is shown in the following illustration.

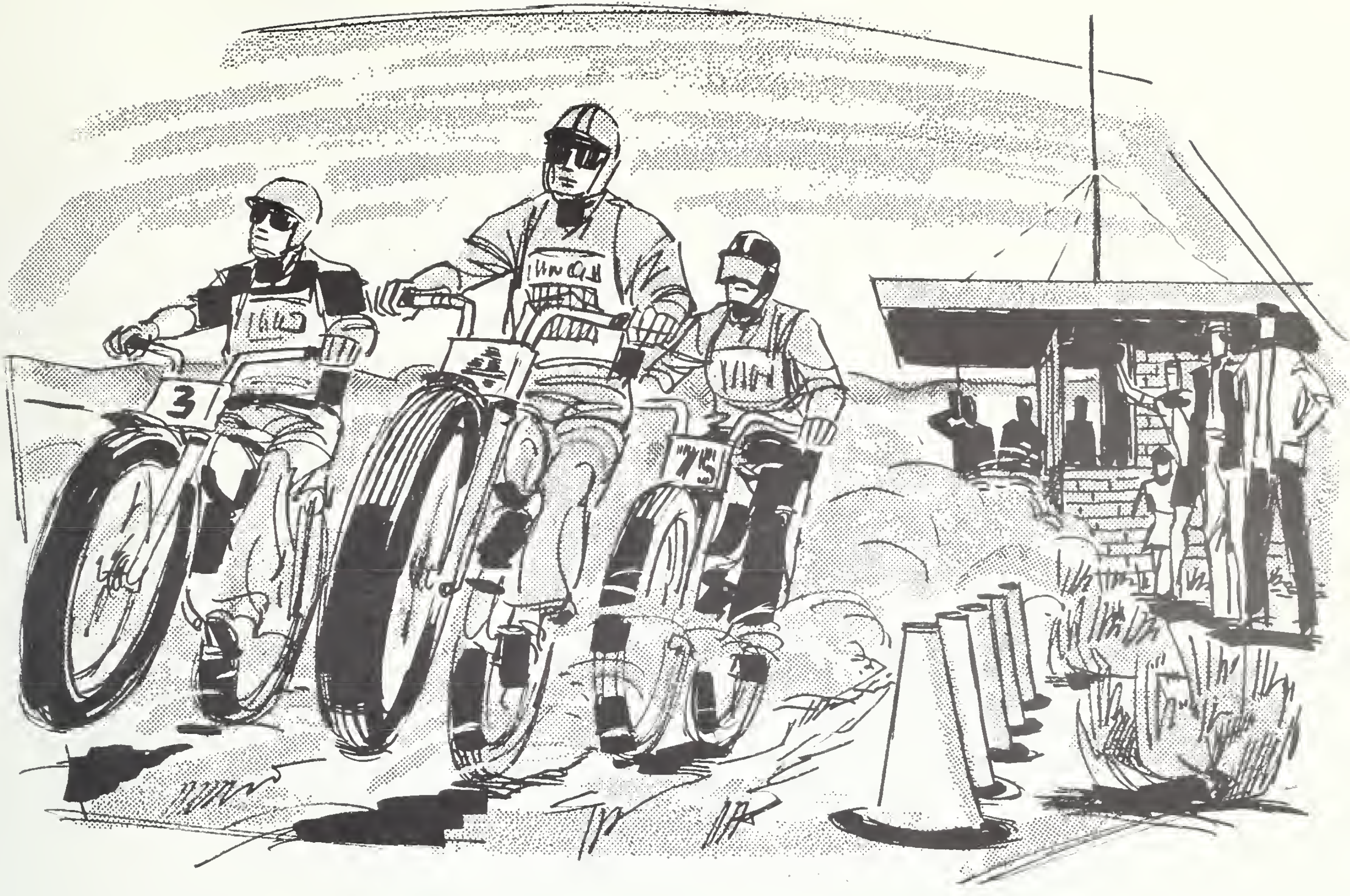
The marshalling area, in addition to being the hub for several raceway areas, would be located adjacent to hills appropriate for hill climbing activities. Hill climbing would only be allowed in a few selected areas. Through subtle control of surface drainage, the same hill could be used indefinitely.

In the Cycle Center area, the trails would be run on a contour where slopes of thirty percent or more are encountered. They would be as crooked as possible and would use dry washes where possible. Every effort to protect vegetation should be taken, including the prohibition of cutting vegetation of any kind for firewood.

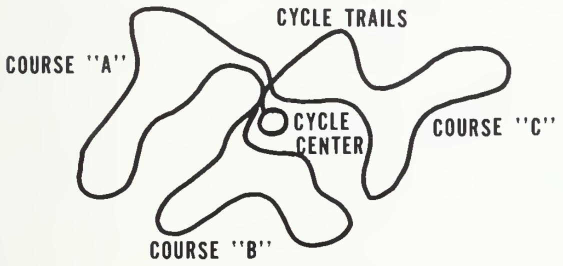
Long overland races could be handled on mutually selected routes between two or more Cycle Centers.

Areas for cross-country motorcycle use would be designated in connection with the Cycle Centers. Additionally, BLM should seek other cross-country routes throughout the entire Public Domain land in the California Desert to provide a challenge to the motorcyclist and to satisfy his desire for a competetive encounter with nature. These routes or trails would necessarily be selected with equitable regard for the rights and privileges of other users of the Public Domain.

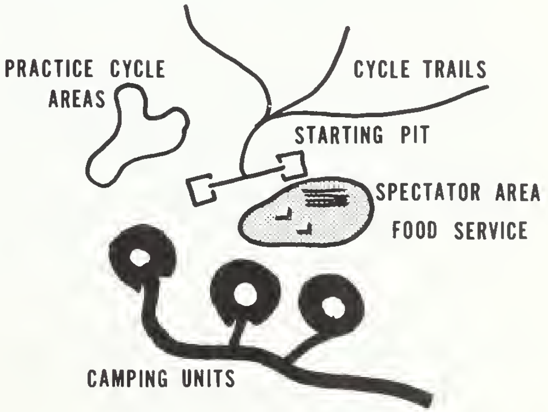
BLM should also provide the required services and control measures to properly regulate this kind of use in areas where it has damaging effects on the desert environment or threatens important natural, scientific, historical, or recreational resources.



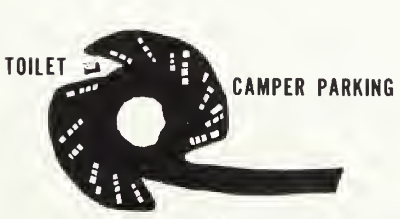
CYCLE COURSE DEVELOPMENT


CYCLE TRAILS
COURSE "A"
CYCLE CENTER
COURSE "C"
COURSE "B"

CYCLE COURSE


PRACTICE CYCLE AREAS
CYCLE TRAILS
STARTING PIT
SPECTATOR AREA
FOOD SERVICE
CAMPING UNITS

CYCLE CENTER BLOWUP


TOILET
CAMPER PARKING

CAMPING UNIT BLOWUP

O. INTERPRETIVE PROGRAM

Present Situation

The Bureau of Land Management presently makes some attractive brochures, maps, and other literature available to the public along with information signs which describe the recreational as well as other resources of the Public Domain lands. This is, in reality, the beginning of an interpretive program and too much emphasis can not be placed on the encouragement and support of this activity.

These programs provide the public with information and knowledge in an enjoyable form. Through knowledge, the people gain respect for the tangible and intangible values of their Public Domain lands. This respect is reflected in the actions and attitudes of the public which, in turn, pays off in the prevention of litter, vandalism, and destruction of public resources, as well as in the insistence of the people on the wise use and management of public property.

Interpretive programs normally tend to increase public use and enjoyment of a given area. When fragile or irreplaceable resources are involved, such as historical or archaeological sites, adequate facilities, and methods of preventing vandalism or accidental destruction must be provided.

Concepts and Recommendations

BLM should undertake a major interpretive program by providing educational and informational material about the California Desert lands and resources to the public. This program envisions the use of brochures, maps, exhibits, and signs. Interpretive facilities should be developed at proposed Way Stations and in on-site locations where appropriate. A major interpretive program should be developed for the proposed Desert Center facility.

BLM should also develop and cooperate in environmental conservation programs for the public schools to explain and interpret the desert and its resources to our young Americans. This conservation education program envisions the use of certain desert areas to provide on-the-ground desert experiences for school children in cooperation with California schools and school districts, as well as young people's groups.

The entire interpretive program, however, must be geared to the establishment of a ranger force and the construction of Way Stations. Until facilities and methods of protection are developed, the identification of interpretive sites as points of interest on the California Desert could lead to their destruction, damage, and loss of their interpretive values.

P. UNIVERSITY AND PROFESSIONAL ASSISTANCE

Present Situation

Proposals have been made to designate a number of natural areas for scientific study in the California Desert in cooperation with universities and other scientific institutions. There has been no planned program for the establishment of such areas, nor is there an integrated system to maintain control and management of present and future areas of this sort.

The Bureau of Land Management does not have the scientifically trained staff to study fully and evaluate many areas of the desert that have important natural or scientific values. This situation inhibits the identification of such areas and in some cases valuable resources are in danger of loss or destruction.

Concepts and Recommendations

BLM should negotiate cooperative agreements with universities and other scientific institutions to recognize and identify valuable natural or scientific resources in the California Desert. To preserve examples of these and to provide opportunities for further studies, relatively small natural and scientific areas would be established, probably within the Recreation Lands, representing various ecosystems or other resources valuable for such studies. Information that is gathered would be used by BLM in developing its management and interpretive program at the site, as well as at the Way Stations and Desert Center.

Q. CLEANUP AND MAINTENANCE

Present Situation

Vast areas of Public Domain land in the California Desert are being littered with trash and debris, left behind by the highway traveler, recreation user, and others. Vandalism at the few recreation facilities is a problem. The Bureau of Land Management has very limited capabilities to handle maintenance and cleanup problems today.

The magnitude of the problem precludes the development of enough installations to house the equipment and staff necessary for a permanent maintenance force. It is also doubtful whether the efficiency of such a force would justify the costs under the physical limitations that are present.

Concepts and Recommendations

BLM should undertake an aggressive public informational education program to make the American public, and recreationists in particular, aware of their responsibilities for keeping the public lands clean and recreation facilities in good condition. The success of this program would help to determine whether the widespread casual recreation use of the desert now enjoyed by many can continue without stricter regulations for recreational control being required to prevent vandalism and litter.

BLM should meet its responsibilities for cleanup and maintenance of the California Desert land with the following program.

In the more remote areas the most feasible course of action would be to hire local residents for cleanup and maintenance and either provide them with the necessary vehicles or reimburse their vehicular costs. Near communities, cleanup and maintenance contracts can be awarded on a competitive basis. This is being done by BLM in other areas to some extent at the present time.

Road maintenance and cleanup, as well as some maintenance of recreation facilities, could be done through cooperative agreements with County, State, or neighboring Federal agencies, where possible.

BLM Rangers, described in Section "G" of the Concepts and Recommendations, would supervise the cleanup and maintenance effort, including work that is contracted or negotiated through cooperative agreements.

R. PUBLIC PARTICIPATION AND THE DEVELOPMENT OF A DESERT PLAN

Present Situation

The California Desert is primarily Public Domain land under the jurisdiction of the Bureau of Land Management. Because much of the land area for which BLM is responsible falls into the category of desert land, this agency has the basic experience, and should logically administer Federal desert lands for multiple use purposes.

There is a recognized demand for outdoor recreation in the southern California desert areas, and this demand is growing by leaps and bounds. The California desert has great potential for meeting this demand, if properly managed.

The California Desert Study is the first step in assessing the development and management of recreation on desert lands. It is evident that there is a broad scale public interest in recreation opportunities there. This public interest includes a wide and diverse number of individuals, user groups, organizations, businesses, and public agencies.

Based on existing law, policy, and regulation, BLM encourages the fullest possible public participation in matters affecting the use and development of Public Domain lands.

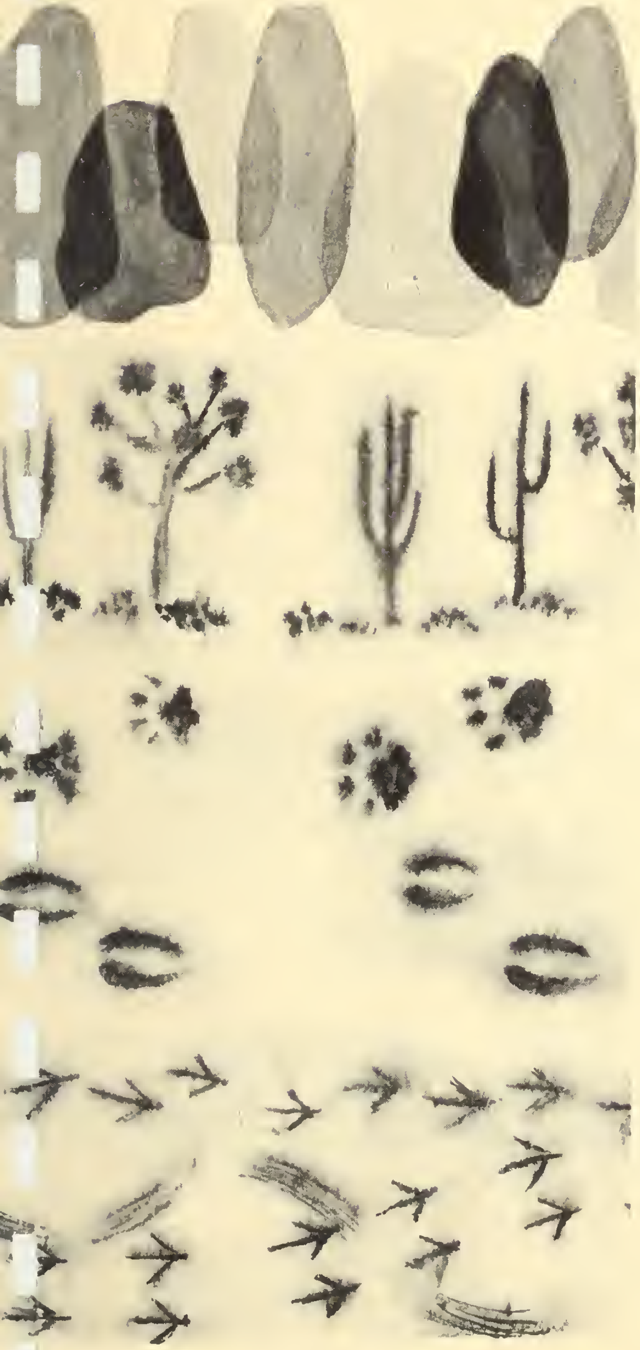
Concepts and Recommendations

The next step BLM should take following the California Desert Study is the development of a program to insure full public participation in planning for the future multiple-use of the desert, including desert recreation.

BLM should develop a basic publication, or brochure, summarizing the findings of this study, in a high quality, readily understandable format, to be used for public dissemination. BLM should present information on the findings of this study to all interested individuals and groups; and should seek comment and counsel from all interested sources, particularly the user groups, such as the livestock growers, mining interests, conservation organizations, and recreationists. Because of the great scope and potential of the California Desert, this program and the materials developed for it would be of such quality that they would effectively support a level of significant public interest. Hopefully, representatives of the various interests would advance suggestions for compatible multiple-use, to the benefit of all.

BLM should also begin immediately the preparation of a comprehensive concept plan covering all the resources in the California Desert area. This plan would serve to identify the California Desert area as a national project, and support the necessary funding and manpower for the detailed planning, development, and implementation of a sound management program for the desert. The comprehensive concept plan should be undertaken immediately for presentation to the Secretary of the Interior, the Bureau of the Budget, and Congress next year.

BLM is the national agency which has the knowledge and experience to manage the desert and semi-desert areas that are so typical of the Public Domain. This plan could lead to the establishment of the means which BLM must have to conduct a sound program for multiple-use desert land management in the overall public interest.



SILHOUETTES

PART IV

SILHOUETTES OF SELECTED CALIFORNIA DESERT RECREATION LANDS

This part of the study presents a brief outline or "Silhouette" for each of 19 selected areas on the California Desert. These areas, identified as Recreation Lands, cover some 3,273,000 acres.

These areas were selected on the basis of their recreation potential, and increasing present use which, in many cases, was endangering the natural, scientific, and recreational values and management of this land. A survey of each of the Recreation Land areas was made by the California Desert Study team during a six week period in March and April, 1968.

The team found that all these areas provided a variety of recreational resources. Some contained unique or outstanding natural values for public enjoyment and scientific study; others provided open space and remarkable opportunities for recreational activities; and some provide an opportunity to enhance the environment of growing urban areas as well.

Three Recreation Land areas contain registered National Natural Landmarks. These are Rainbow Basin within the Calico area, the Imperial Sand Hills, and the Tufa Pinnacles. In addition, Cima Dome with its Joshua Tree forest and the volcanic Cinder Cones within the Eastern Mojave Recreation Lands appear qualified for recognition as National Natural Landmarks now. Afton Canyon Recreation Lands and the Coyote Mountains in the Yuha Desert Recreation Lands should also be studied for such recognition. Future detailed studies will undoubtedly uncover other areas for similar recognition.

It is important to note that, because of the short period of the survey, many well known recreation activities, such as hunting, enjoyed in the desert were not observed because they are pursued in a different season of the year. Also, time did not permit observation or detailed study of many presently unrecognized natural values or specialized recreation activities.

In the silhouettes figures given for land status are approximate, and non-Federal lands, such as school sections, are included in the "private" designation.

Comments are based on the observations of the study team and can serve as guidelines for future detailed studies. Proposed boundaries for the recreation lands must be considered tentative until detailed studies have been completed.

This survey indicated that some Recreation Lands needed more attention at this time than others because of the effects of present use. As a guide for future planning programs, these Recreation Lands have been placed into three priority groups based on the following factors:

Priority Group I	Existing heavy recreation use Proximity to population centers Extreme vulnerability of remaining natural values
Priority Group II	Increasing recreation use Unusual values needing protection as soon as possible
Priority Group III	Remoteness Unusual values where protection is not as urgent

Part IV

SILHOUETTES OF SELECTED CALIFORNIA DESERT RECREATION LANDS

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CALICO

Priority Group I

CALICO RECREATION LANDS

Type of Area: Natural, Historical, and Recreational

Land Status (approximate):

Public Domain	139,000 acres
Private	69,000 acres
Total	208,000 acres

Access: Several improved and unimproved roads enter the Calico area from Interstate 15 and State Highway 58 a few miles to the south.

Observations: This area receives intensive recreation use. Litter and trash have accumulated. Archaeological values have been extensively vandalized or even have been removed from the area. The Rainbow Basin National Natural Landmark, significant for its geological values, is located within the area.

Comments: When the Bureau of Land Management acquires a ranger force, this area must receive priority attention in order to halt the continuing despoliation of this area. It should also receive priority attention when a maintenance operation has been established.

Geological values including multi-colored mountains are outstanding at Rainbow Basin and good in the vicinity of the Calico Ghost Town. The best biological area is at Joshua View where a large stand of Joshua Trees exist. Wildlife is abundant. There are also some ecological values. Wildlife is found throughout the area and hunting for chukar, quail, doves, and rabbits is widespread.

Petroglyphs are relatively common, particularly in the western portion of the area.

The Calico Ghost Town has been restored and is now operated by San Bernardino County. The County also operates a campground adjacent to the ghost town.

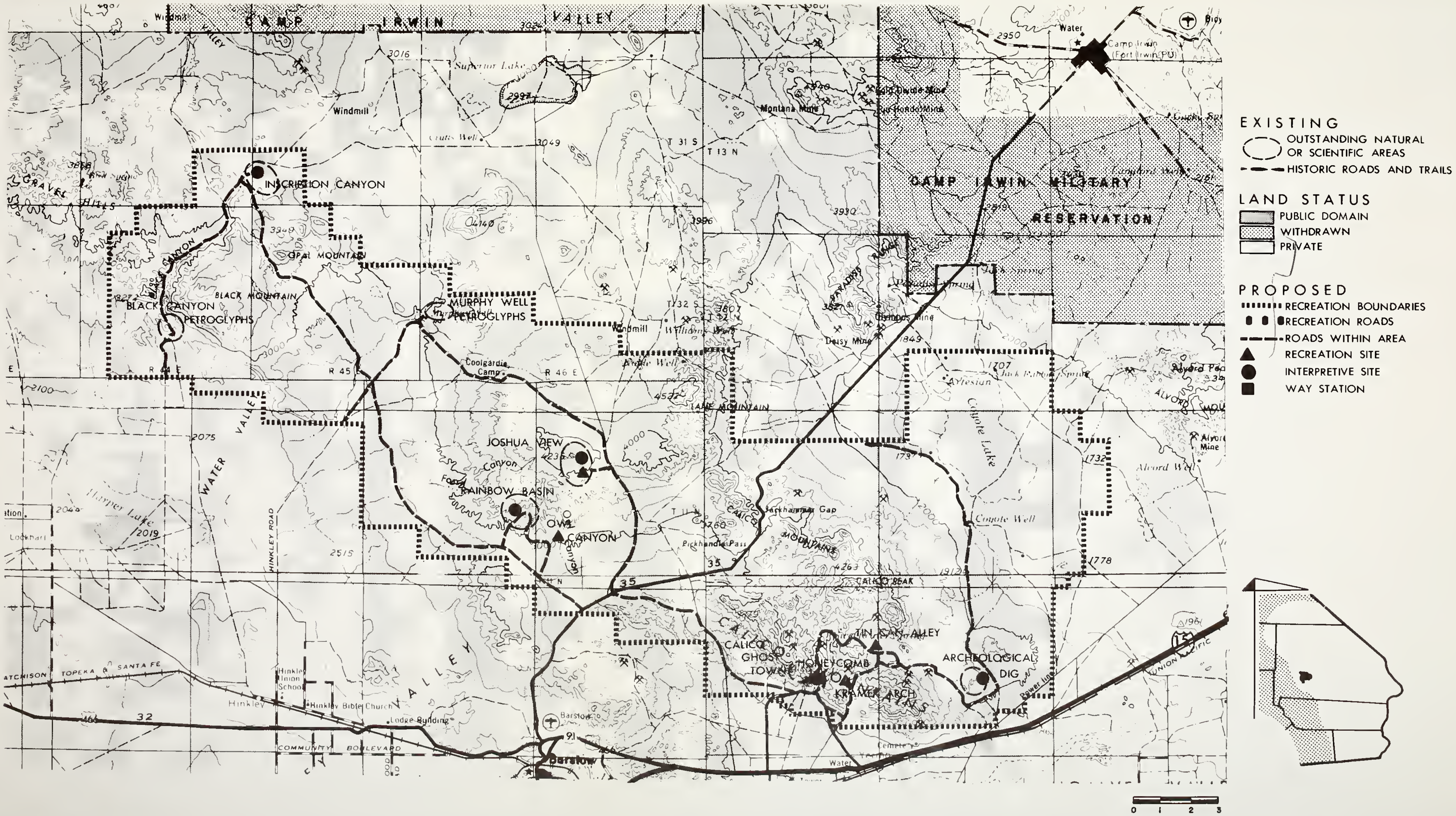
BLM is developing a recreation facility in Owl Canyon, immediately east of Rainbow Basin. Additional camping facilities near Kramer Arch and in the vicinity of "Tin Can Alley" are proposed.

Facilities proposed at Joshua View should be limited to picnicking because of the natural values in the vicinity. Excellent panoramic views of the desert to the north as well as a cooler climate can be enjoyed here.

An interior road system is shown on the following map. For the most part, it takes advantage of existing access routes and roads within the area.

An interpretive sign has been provided at Rainbow Basin. Modest interpretive signs should also be provided at Inscription Canyon, a gallery of Indian petroglyphs; at Joshua View for reasons previously mentioned; and at Honeycomb, the unique result of earlier mining activity. Archaeological excavations in the Calico "Ancient Man" Archaeological Dig area are extensive and of scientific importance; however, appropriate interpretation of the area should wait until the research activity has been completed and evaluated.

Public information regarding this area will be available at the proposed Barstow Way Station.


CAMP IRWIN VALLEY
Camp Irwin (Fort Irwin PO)
Water
CAMP IRWIN MILITARY RESERVATION
INSCRIPTION CANYON
GRAVEL HILLS
BLACK CANYON
BLACK MOUNTAIN
BLACK CANYON PETROGLYPHS
OPAL MOUNTAIN
MURPHY WELL PETROGLYPHS
Superior Lake
Windmill
Coolgardie Camp
Montana Mine
Gold Divide Mine
Rio Hondo Mine
PARADISE RANGE
Daisy Mine
Williams Well
LANE MOUNTAIN
JOSHUA VIEW
RAINBOW BASIN
Fossil Canyon
OWL CANYON
WATER VALLEY
Harper Lake
HINKLEY ROAD
Hinkley
Hinkley Union School
Hinkley Bible Church
Lockhart
ATCHISON TOPEKA & SANTA FE
COMMUNITY BOULEVARD
Barstow
VALLEY
Coyote Lake
Coyote Well
Alvord Well
Alvord Mine
Jackhammer Gap
Pickhandle Pass
CALICO MOUNTAINS
CALICO PEAK
CALICO GHOST TOWN
HONEYCOMB
TIN CAN ALLEY
KRAMER ARCH
ARCHEOLOGICAL DIG
UNION PACIFIC
T 31 S
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15
466
EXISTING
OUTSTANDING NATURAL OR SCIENTIFIC AREAS
HISTORIC ROADS AND TRAILS
LAND STATUS
PUBLIC DOMAIN
WITHDRAWN
PRIVATE
PROPOSED
RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
▲ RECREATION SITE
● INTERPRETIVE SITE
■ WAY STATION
0 1 2 3

CALICO

IMPERIAL SAND HILLS

Priority Group I

IMPERIAL SAND HILLS RECREATION LANDS

Type of Area: Natural, Historical, and Recreational

Land Status (approximate):

Public Domain	77,000 acres
Private	19,000 acres
Withdrawn	201,000 acres
Total	297,000 acres

Access: Major access to this area is provided by Interstate 8, a few miles north of the Mexican border, and State Highway 78.

Observation: The Imperial Sand Hills Recreation Lands contain one of the most spectacular and extensive areas of sand dunes in the United States. The area is registered as a National Natural Landmark.

Biological, geological, and ecological values range from excellent to outstanding.

The Cargo Muchacho Mountains within the eastern extension of this area also contain excellent geological and ecological values as well as some biological values. Supplementing these values are the historic values associated with such abandoned gold mines as Tumco and American Girl.

Although sightseers and wayside picnickers stop and enjoy the sand dunes and the surrounding desert environment, the off-road vehicular recreationists have adopted the sand hills area. The predominant vehicle is the dune buggy--an automobile chassis equipped with large tires, seats and a roll bar. Dune buggying is often a family activity enjoyed in increasing numbers by the young and old alike.

Most people arrive at the area in a camper pulling the dune buggy on a trailer. There are no overnight camping facilities, so they congregate at wayside facilities along Interstate 8 or at Glamis and the Hugh Osborne Lookout Point on State Highway 78. However, growing numbers use the road shoulders for overnight parking which is a hazardous situation for themselves as well as the highway traveler.

Hunting for dove, quail, and rabbits on the western side of the area between the Coachella and Highline Canals is good, and wildlife habitat in this area is outstanding.

Comments: Even with all the dune buggy activity on the sand hills, the wind rapidly restores the natural setting. However, there are excellent biological, geological, and ecological values associated with these sand hills and vehicular recreation activities do disturb these values. Therefore, in view of the tremendous area encompassed by these sand hills, it is in the public interest that part of them remain in a natural state.

To this end, two Sand Hills Natural Areas have been proposed in the more remote or less used areas of the dunes. To the west of the dunes, there is an outstanding creosote bush area. Supplemental studies may also uncover unusual natural areas in the Cargo Muchacho Mountains that should be preserved.

It is proposed that facilities for off-road vehicular recreation be developed as outlined in the Concepts and Recommendations of this study. Reflecting on the present use of the area, the first development should be in the vicinity of Glamis followed by one in the vicinity of the proposed Sand Hills Way Station and lastly at Mammoth Wash, in the extreme northern end of the sand hills.

In the Cargo Muchacho Mountains, a recreation development, not specifically oriented to off-road vehicles, is suggested in Araz Wash. Future planning must also consider that the former U.S. Naval Impact Range still contains lethal military hardware.

The southern terminus of the California Desert Road will be the proposed Sand Hills Way Station on Interstate 8. This road will parallel the northeast side of the sand hills between Interstate 8 and State Highway 78. A road is suggested along the southern slopes of the Cargo Muchacho Mountains between Ogilby and the proposed Araz Wash recreation site. Elsewhere, improved access to the Mammoth Wash recreation site and to the various interpretive sites would be needed. In the Cargo Muchacho Mountains, improvement of selected existing roads would be adequate.

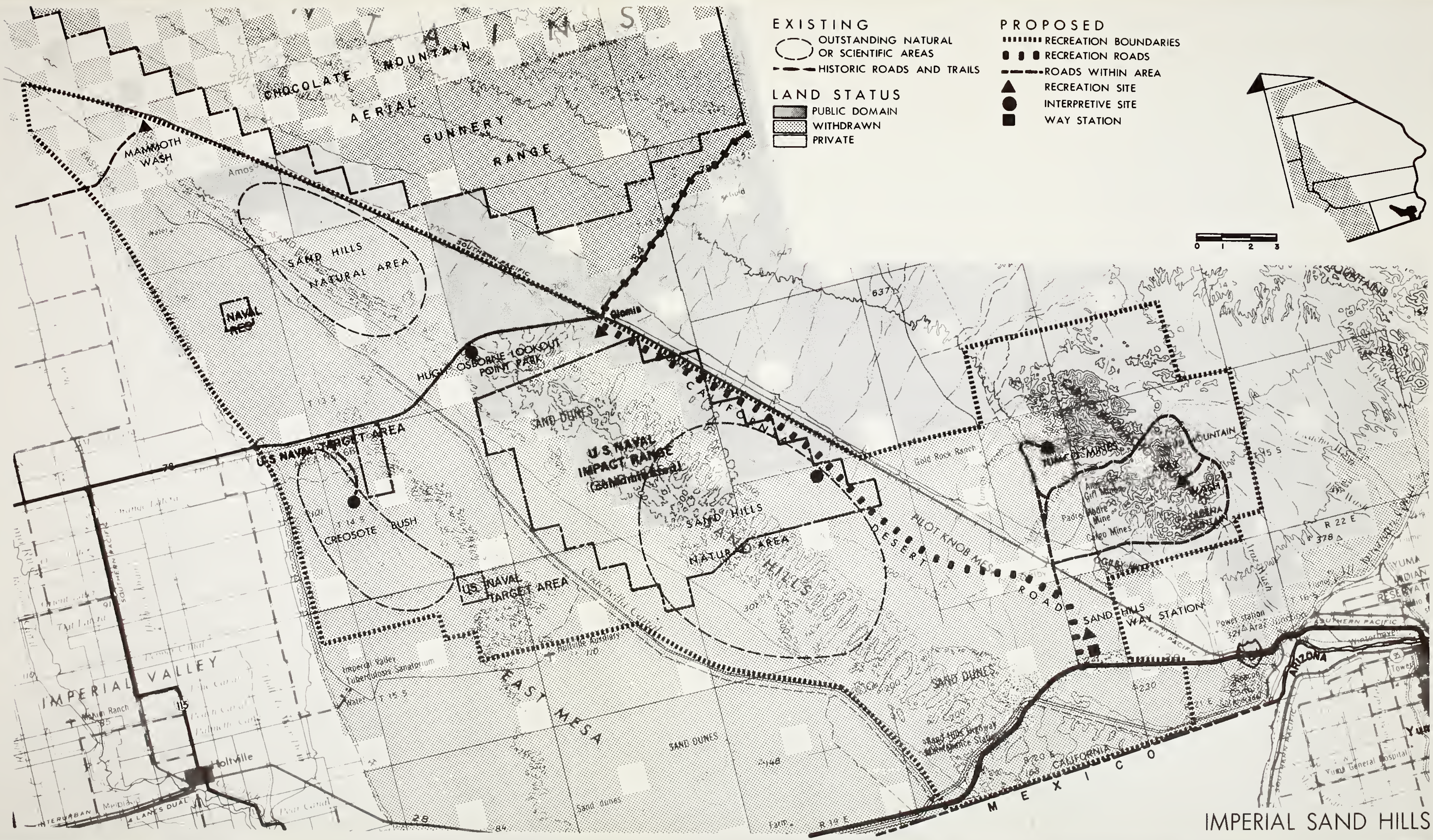
The wildlife potential in the area to the west of the Coachella Canal is remarkably good. This area could provide excellent hunting, and should be investigated in detail.

Tumco Mine is the site of a former gold mining town, now abandoned, which is located in what was once an important gold district in the State. Mining activity began in this area during the Mexican Republic and continued up to the early 1900's. The area offers excellent opportunities to interpret all facets of mining and the extraction of gold.

Supplemental detailed studies of this area may provide additional interpretive areas not indicated on the following map.

Cooperative investigations are being made of existing and potential park and recreation areas along the border by Mexican authorities and the National Park Service with the intention that management and operations of the selected areas be retained by the existing administrating authorities. In view of the recreational resources associated with these sand dunes which extend into Mexico and their proximity to Mexicali, a major population center, these recreation lands should be considered in this International proposal.

Public information for this area will be available at the proposed Sand Hills Way Station.



IMPERIAL SAND HILLS

EXISTING
OUTSTANDING NATURAL OR SCIENTIFIC AREAS
HISTORIC ROADS AND TRAILS
LAND STATUS
PUBLIC DOMAIN
WITHDRAWN
PRIVATE
PROPOSED
RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
RECREATION SITE
INTERPRETIVE SITE
WAY STATION
0 1 2 3
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
MAMMOTH WASH
SAND HILLS NATURAL AREA
NAVAL RES
SOUTHERN PACIFIC
HUGH OSBORNE LOOKOUT POINT PARK
U.S. NAVAL TARGET AREA
U.S. NAVAL IMPACT RANGE
SAND DUNES
CREOSOTE BUSH
SAND HILLS NATURAL AREA
ALGODONES
DESERT ROAD
PILOT KNOB MESA
SAND HILLS WAY STATION
EAST MESA
IMPERIAL VALLEY
Holtville
Imperial Valley Tuberculosis Sanatorium
Holtville Auxiliary
CALIFORNIA
MEXICO
ARIZONA
YUMA INDIAN RESERVATION
Power station
Yuma General Hospital
Gold Rock Ranch
Padre Madre Mine
Cargo Mines
R 22 E
78
115
98

MECCA HILLS

Priority Group I

MECCA HILLS RECREATION LANDS

Type of Area: Natural, Recreational

Land Status (approximate):

Public Domain	21,000 acres
Private	23,900 acres
Withdrawn	100 acres
Total	45,000 acres

Access: A majority of the present access is from State Highway 195 which bisects the area. About a mile and a half of the proposed northern boundary parallels Interstate 10.

Observation: This area of rugged multi-colored canyons is heavily used by hikers, picnickers, and sightseers. Geology is the major natural value. Litter and accumulation of trash are not excessive; however, considerable painting and scratching of names on canyon walls is evident.

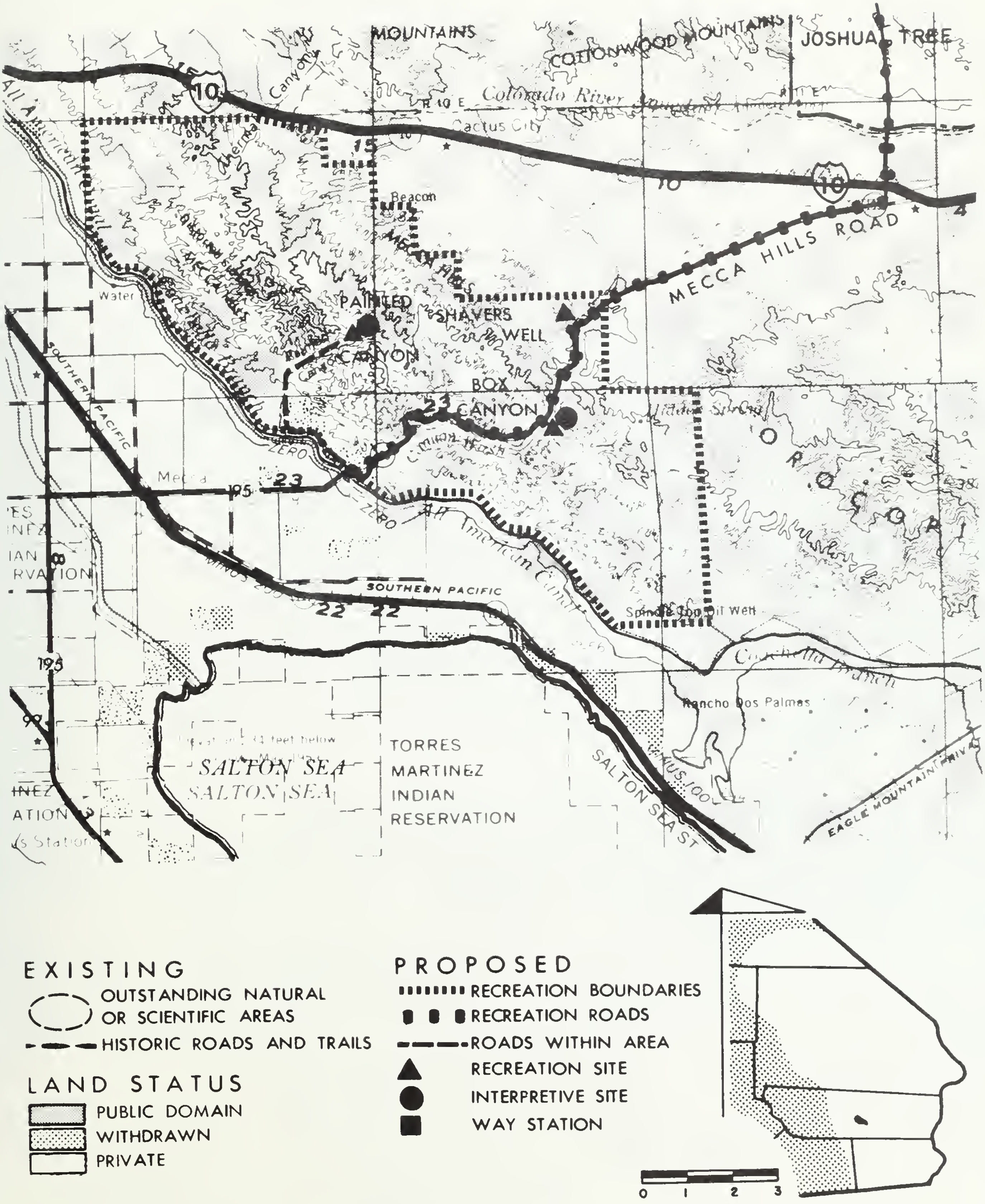
Comments: This area with its rugged hills and canyons is geologically interesting. To assist in retaining the scenic and natural qualities of these canyons as well as restraining the spread of litter and vandalism, three sites have been proposed for development in cooperation with Riverside County.

Because of the history of flash floods in this area, it is suggested that the more inaccessible Painted Canyon site provide only picnic facilities. The other two sites, Shavers Well and Box Canyon, which are both adjacent to State Highway 195, can provide both picnicking and camping facilities. The latter site, Box Canyon, is within short hiking distance of Sheep Hole Oasis, Hidden Spring, and the Grotto, all located in the next canyon to the south. Camping at these sites could be enjoyed by the bedroll camper without the need of developing road access.

The proposed recreation road system has included State Highway 195 as the Mecca Hills Road--a southern extension of the park road through Joshua Tree National Monument. The proposed Shavers Well and Box Canyon developments would be enjoyed as wayside facilities. Access to the Painted Canyon site leaves State Highway 195 near the crossing of the Coachella Canyon. It follows an existing road through the Torres Martinez Indian Reservation and terminates at the picnic development in Painted Canyon.

Only two interpretive sites have been selected--one at the Painted Canyon site and the other at the Box Canyon site.

Information relative to this area would be available at the Coachella Valley Way Station.


MOUNTAINS
COTTONWOOD MOUNTAINS
JOSHUA TREE
10
Colorado River Aqueduct
Cactus City
15
Beacon
MECCA HILLS ROAD
PAINTED CANYON
SHAVERS WELL
BOX CANYON
23
Mecca
195
SOUTHERN PACIFIC
22
All American Canal
Spindle Top Oil Well
Coachella Branch
Rancho Dos Palmas
TORRES MARTINEZ INDIAN RESERVATION
SALTON SEA
SALTON SEA ST
EAGLE MOUNTAIN RAILWAY
OROCOPIA
99
US 100
EXISTING
OUTSTANDING NATURAL OR SCIENTIFIC AREAS
HISTORIC ROADS AND TRAILS
LAND STATUS
PUBLIC DOMAIN
WITHDRAWN
PRIVATE
PROPOSED
RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
RECREATION SITE
INTERPRETIVE SITE
WAY STATION
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3

MECCA HILLS

REDROCK CANYON

Priority Group I

REDROCK CANYON RECREATION LANDS

Type of Area: Recreational

Land Status (approximate):

Public Domain	8,400 acres
Private	2,500 acres
Withdrawn	100 acres
Total	11,000 acres

Access: The area is bisected by State Highway 14, which is mostly undivided four lane highway.

Observations: The area now receives intensive day and overnight use which is rapidly ruining the remaining natural values. The area is littered with trash and the terrain is extensively scarred by uncontrolled motorcycle and off-road vehicular recreation use. The area receives intensive use by hunters for upland game, quail, chukar, and rabbits.

Comments: Present casual and promiscuous use must be controlled as soon as possible. Access problems in this area where roads or public lands are blocked by private landowners should be cleared up as soon as possible to provide maximum use of the area by campers, hunters, and other recreationists.

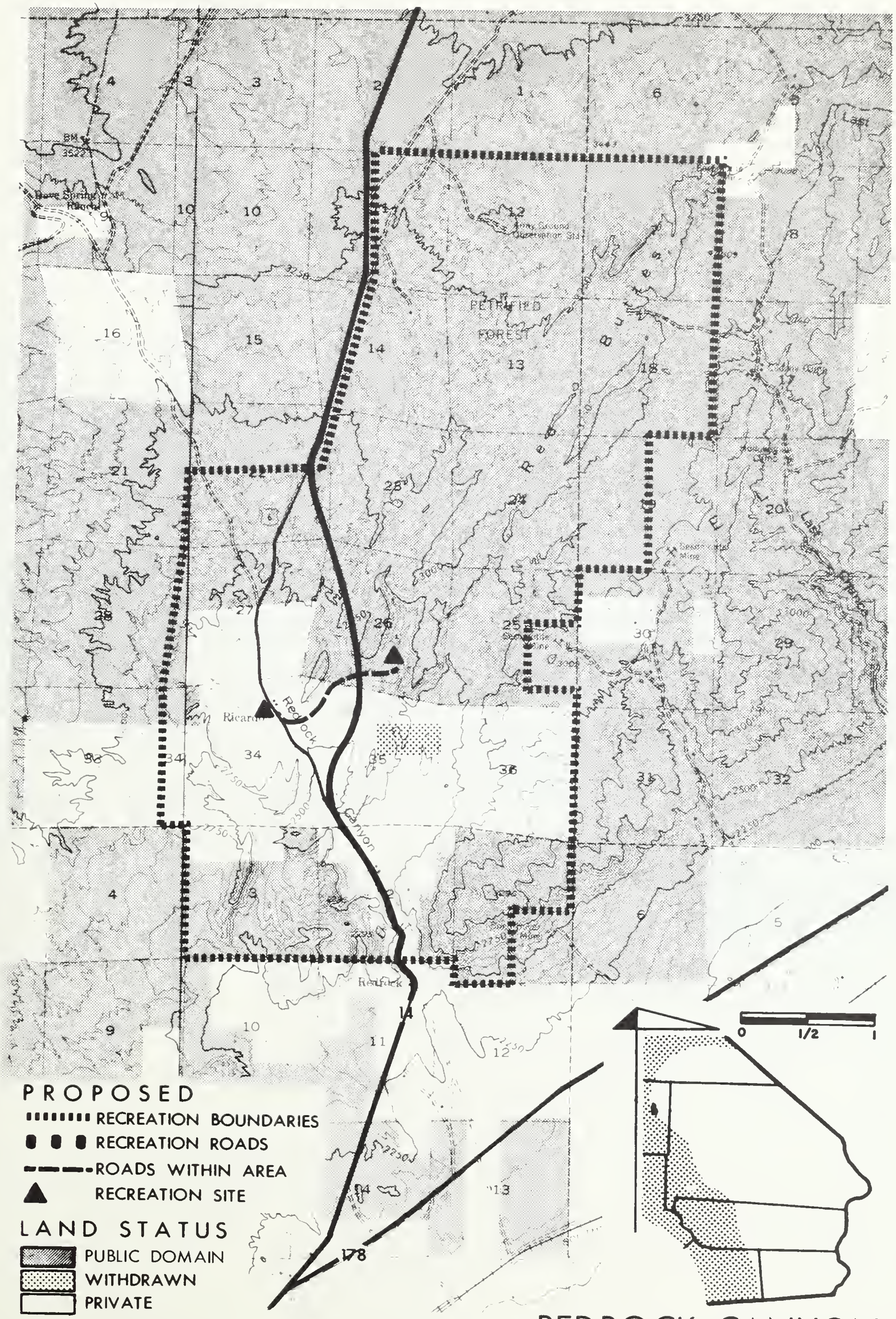
Sufficient day and overnight recreation facilities should be developed in defined areas. Likewise, definite areas must be selected for motorcycle and off-road vehicular use. There is not sufficient space for a cycle center; however, one of the proposed developments should be an off-road vehicular facility.

An interchange is required on State Highway 14 for safe ingress and egress and as a connection between areas east and west of the highway.

A possible location for an interchange and recreation developments are shown on the following map.

The geological values in this area have good interpretive potential, but other natural resources have been severely damaged by human use.

Information relative to this area would be available at the proposed Mojave Way Station and any future proposed way station northward on U.S. 395.


PROPOSED
RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
RECREATION SITE
LAND STATUS
PUBLIC DOMAIN
WITHDRAWN
PRIVATE
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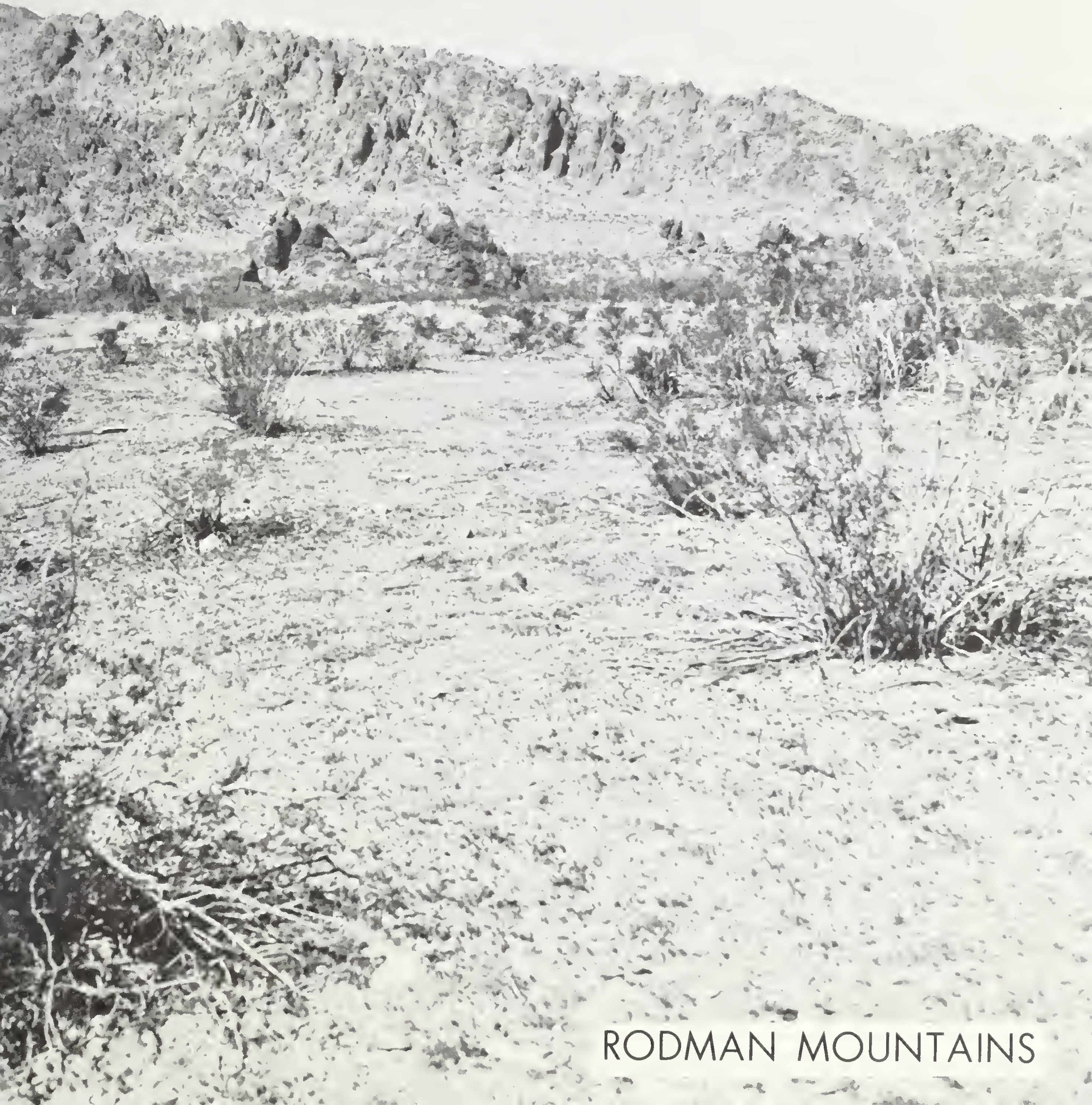
1
PETRIFIED FOREST
Ricardo
Redrock
Red Rock Canyon
Red Buttes
Last Chance
14
178

REDROCK CANYON



RODMAN MOUNTAINS

Priority Group I

RODMAN MOUNTAINS RECREATION LANDS

Type of Area: Recreational

Land Status (approximate):

Public Domain	330,100 acres
Private	123,100 acres
Withdrawn	800 acres
Total	454,000 acres

Access: Major access to the area is from the paved county road running between Barstow and Lucerne Valley, which bisects the Rodman Mountains Recreation Land area. Interstate 15 is close to the west border of this area, and Interstate 40 closely parallels the north boundary. State Highway 18 from Victorville to Lucerne Valley is close to the south border.

Observations: Natural values are only average for this desert region; however, excellent archaeological values exist within the eastern portion. The area is very popular with motorcyclists and considerable camping and picnicking is enjoyed. Hunters use this area for upland game, quail, doves, chukar, and rabbits. Trash has accumulated in areas of heavy use.

Comments: Although the natural values within the Rodman Mountains Recreation Lands are only average, this large area is increasingly valuable for recreation purposes as the nearby urban areas grow. This open space, as a backdrop to these communities, has a monetary as well as environmental value to those who reside in the surrounding valleys. Likewise, future recreation development within the area should reflect the recreation desires of these people. In the meantime, the Bureau of Land Management should address itself to rectifying the checkerboard land ownership pattern throughout the area.

Two county parks obtained through the Recreation and Public Purposes Act are located within the Rodman Mountains Recreation Lands. Only two other development sites have been indicated on the following map; however, subsequent studies will undoubtedly select other attractive sites for family or group camping and picnicking.

A proposed network of roads has been selected within the area which would provide a variety of sightseeing loop roads for the nearby communities. At appropriate locations, the addition of trash receptacles, tables, and sanitary facilities could provide opportunities for wayside family picnicking. These roads would also provide access routes through the area for hunters.

Other existing roads and trails could be designated for use to meet the needs of the trail riding motorcyclists and off-road vehicles. Still others could be designated only for hiking or riding.

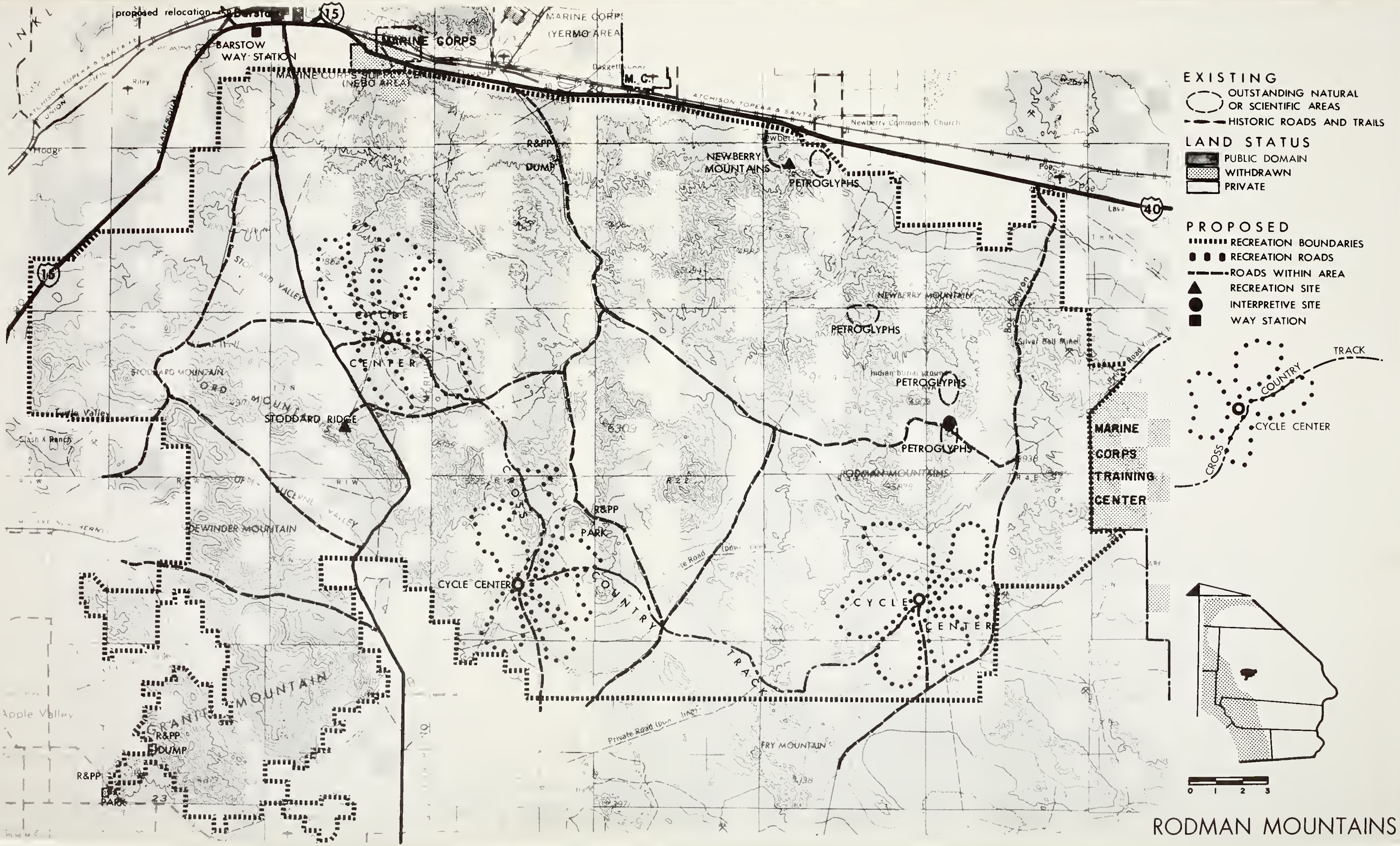
Reflecting the present recreation needs of the nearby urban areas is the present motorcycle racing use in the proposed Rodman Mountains Recreation Lands. Because of this need, three Cycle Centers have been suggested. Although it is realized that considerably more study is necessary prior to the selection of the exact location of these Cycle Centers, tentative locations indicated on the map delineate a scheme of developments for the motorcycle racing enthusiasts.

Hopefully, by rotating use of the terrain around the Cycle Centers, the desert surface can be conserved and the motorcyclists will not be continually searching for new racing areas. Although three possible Cycle Centers have been indicated on the map, they should only be developed as needed. Also, a possible route for cross country racing has been indicated on the map connecting the three proposed Cycle Centers.

One interpretive site has been selected for the time being. It is very likely that future archaeological investigations may uncover other sites of more significance which suggests the need for an interpretive prospectus at that time reflecting the potential archaeological values.

The information center for this area would be the proposed Barstow Way Station; however, similar information should also be available at the proposed Desert Center near San Bernardino.

The proposed location of the Barstow Way Station is based on the present California Highway Department plans to reroute State Highway 58 across the Mojave River west of Barstow to join Interstate 15. Therefore, the Way Station should be located near this junction or immediately to the east. Any change in these plans of the California Highway Department would require reconsideration of the location of the proposed Way Station.


EXISTING
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RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
RECREATION SITE
INTERPRETIVE SITE
WAY STATION
CROSS COUNTRY TRACK
CYCLE CENTER
proposed relocation
Barstow
15
BARSTOW WAY STATION
MARINE CORPS
MARINE CORPS (YERMO AREA)
MARINE CORPS SUPPLY CENTER (NEBO AREA)
M.C.
ATCHISON TOPEKA & SANTA FE
UNION PACIFIC
Riley
Hodge
Daggett
Newberry
Newberry Community Church
NEWBERRY MOUNTAINS
PETROGLYPHS
R&PP DUMP
40
Lava
STODDARD VALLEY
CYCLE CENTER
STODDARD MOUNTAIN
ORD MOUNTAINS
STODDARD RIDGE
Turtle Valley
Slash X Ranch
LUCERNE VALLEY
DEWINDER MOUNTAIN
NEWBERRY MOUNTAIN
Indian Burial Mound
Silver Bell Mine
Box Canyon
RODMAN MOUNTAINS
MARINE CORPS TRAINING CENTER
R&PP PARK
CROSS COUNTRY TRACK
CYCLE CENTER
Private Road
FRY MOUNTAIN
GRANITE MOUNTAIN
R&PP DUMP
R&PP PARK
Apple Valley
0 1 2 3

RODMAN MOUNTAINS

YUHA DESERT

Priority Group I

YUHA DESERT RECREATION LANDS

Type of Area: Natural, Historical, and Recreational

Land Status (approximate):		
	Public Domain	113,000 acres
	Private	11,600 acres
	Withdrawn	35,400 acres
	Total	160,000 acres

Access: Interstate 8 and State Highway 98 pass through the area and offer excellent access.

Observation: This rolling desert terrain abruptly changing into rugged desert mountains offers a wide variety of recreation opportunities. The area is adjacent to the Anza-Borrego State Park and has outstanding geological values as well as archaeological and historical values. The canyons are quite scenic when light conditions bring out the colors.

This is the nearest desert area to the San Diego Metropolitan Area and receives intensive camping, picnicking, hiking, and sightseeing use. Motorcycles, dune buggies, and jeeps roam the desert at will. No recreation facilities, except for a few trash cans, are available.

Trash has accumulated and extensive scarring of the terrain has occurred in areas of heavy use. Archaeological values have been vandalized and removal of paleontological values is commonplace.

The Myers Valley-Pinto Canyon and the Crucifixion Thorn areas are of botanical interest and have not suffered much from the uncontrolled use.

The Coyote Mountains area is a relatively undisturbed area of unusual paleontological values and consideration should be given to designating this area as a National Natural Landmark. Light hunting use is made of the area for upland game animals and quail.

Comments: This area needs priority attention by the Bureau of Land Management. The assortment of natural, scientific, historical, and recreational values cannot long endure the present intensive uncontrolled and promiscuous use; therefore, selection and definition of areas for the various recreation activities must be done as soon as possible.

Camping and picnicking facilities are needed now at Painted Gorge. Similar facilities at Yuha Wells and adjacent to the proposed Yuha Desert Way Station will be needed in the near future.

Motorcycle and off-road vehicular use must be restricted to specific trails or areas.

Access roads to developments or interpretive sites must be well defined, and in this area terminated near the mouth of Painted Gorge and Fossil Canyon. The Coyote Mountains area should be made inaccessible to all vehicular use. The areas containing the partially fenced Indian intaglios and the Crucifixion Thorn area should be completely fenced.

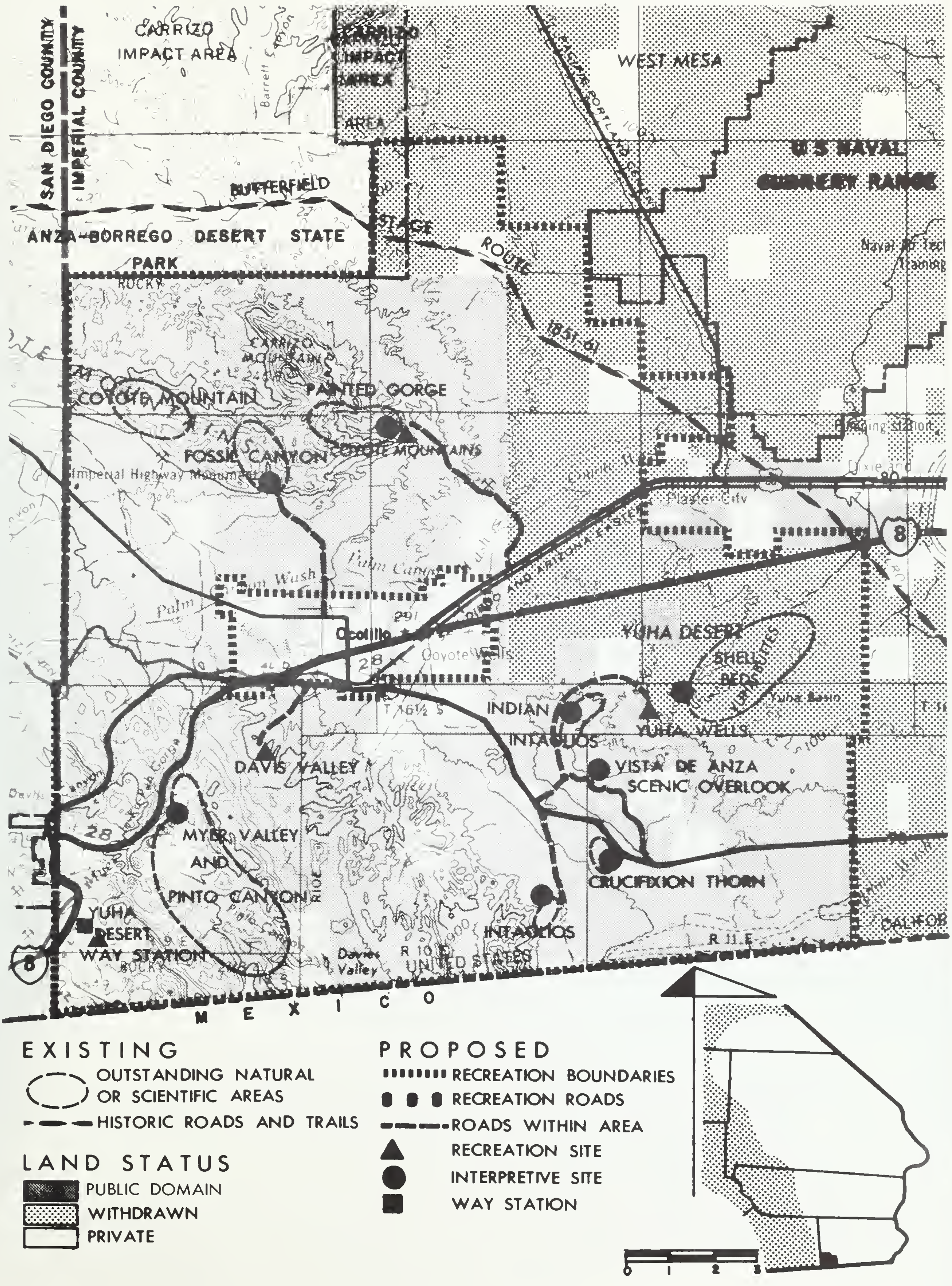
Interpretive signs should not be installed at the areas shown on the following map until BLM has a ranger force in the area.

An interpretive prospectus is badly needed as an aid in selecting areas for the various activities and to determine the approximate route of Captain Juan Bautista de Anza through this area, reportedly the first European to blaze a trail across the California Desert. There may also be interesting interpretive opportunities in relation to the Butterfield Stage Route.

Information gained through subsequent detailed studies of this area would be made available at the proposed Yuha Desert Way Station.

Camping and picnicking facilities have been previously suggested at this Way Station. Since the proposed location of this Way Station is somewhat cooler than the desert to the east, it is expected that cross-country travelers on Interstate 8 will enjoy and use the facilities, too. Furthermore, this will be a convenient location for recreationists from the San Diego metropolitan area to gather information about the Yuha Desert Recreation Lands and the California Desert in general. Therefore, BLM plans should consider facilities at this Way Station for dispensing information. The station should probably be manned initially, at least on weekends.

Finally, cooperative investigations are being made of existing and potential park and recreation areas along the border by Mexican authorities and the National Park Service with the intention that management and operations of the selected areas be retained by the existing administrating authorities. The variety of recreation opportunities within the Yuha Desert Recreation Lands, coupled with the proximity of such large population centers as Mexicali, Tijuana, and San Diego, suggests consideration of the area in this International proposal.


SAN DIEGO COUNTY
IMPERIAL COUNTY
CARRIZO IMPACT AREA
CARRIZO IMPACT ANNEX AREA
WEST MESA
U.S. NAVAL GUNNERY RANGE
BUTTERFIELD STAGE ROUTE 1851-61
ANZA-BORREGO DESERT STATE PARK
ROCKY
CARRIZO MOUNTAIN
COYOTE MOUNTAIN
PAINTED GORGE
COYOTE MOUNTAINS
FOSSIL CANYON
Imperial Highway Monument
Palm Canyon Wash
Ocotillo
Coyote Wells
Plaster City
SAN DIEGO AND ARIZONA EASTERN
YUHA DESERT
SHELL BED
LAND BUTTES
Yuha Basin
INDIAN INTAGLIOS
YUHA WELLS
VISTA DE ANZA SCENIC OVERLOOK
DAVIS VALLEY
MYER VALLEY AND PINTO CANYON
CRUCIFIXION THORN
INTAGLIOS
YUHA DESERT WAY STATION
UNITED STATES
MEXICO
CALIFOR
R 10 E
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8
28
80
98
Davies Valley
Naval Tech Training
Pumping Station
Dixie and
EXISTING
OUTSTANDING NATURAL OR SCIENTIFIC AREAS
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PROPOSED
RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
RECREATION SITE
INTERPRETIVE SITE
WAY STATION
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YUHA DESERT

AFTON CANYON

Priority Group II

AFTON CANYON RECREATION LANDS

Type of Area: Natural, Historical, and Recreational

Land Status (approximate):

Public Domain	8,300 acres
Private	9,700 acres
Total	18,000 acres

Access: Interstate 15 follows the north boundary of the Afton Canyon Recreation Lands and access into the area is afforded by a graveled county road.

Observation: This is a very scenic canyon in which the Mojave River reappears as a perennial stream before vanishing again into the desert to the east. The Union Pacific Railroad traverses the canyon with the Afton siding located within the area.

Four miles of improved road connect Afton with Interstate 15; however, downstream a braided system of roadways exists. Considerable earth moving has been carried out, presumably in relation to the railroad. Litter and trash is not an appreciable problem.

Comments: The geological values in this area are outstanding. Biological and ecological values are potentially good; however, roads and the railroad have had a deleterious effect on these values. Since water has generally always been available here, the Mojave Indian Trail, Jedediah Smith, and the Old Government Road presumably passed this way. For the same reasons, the area has potentially good archaeological values.

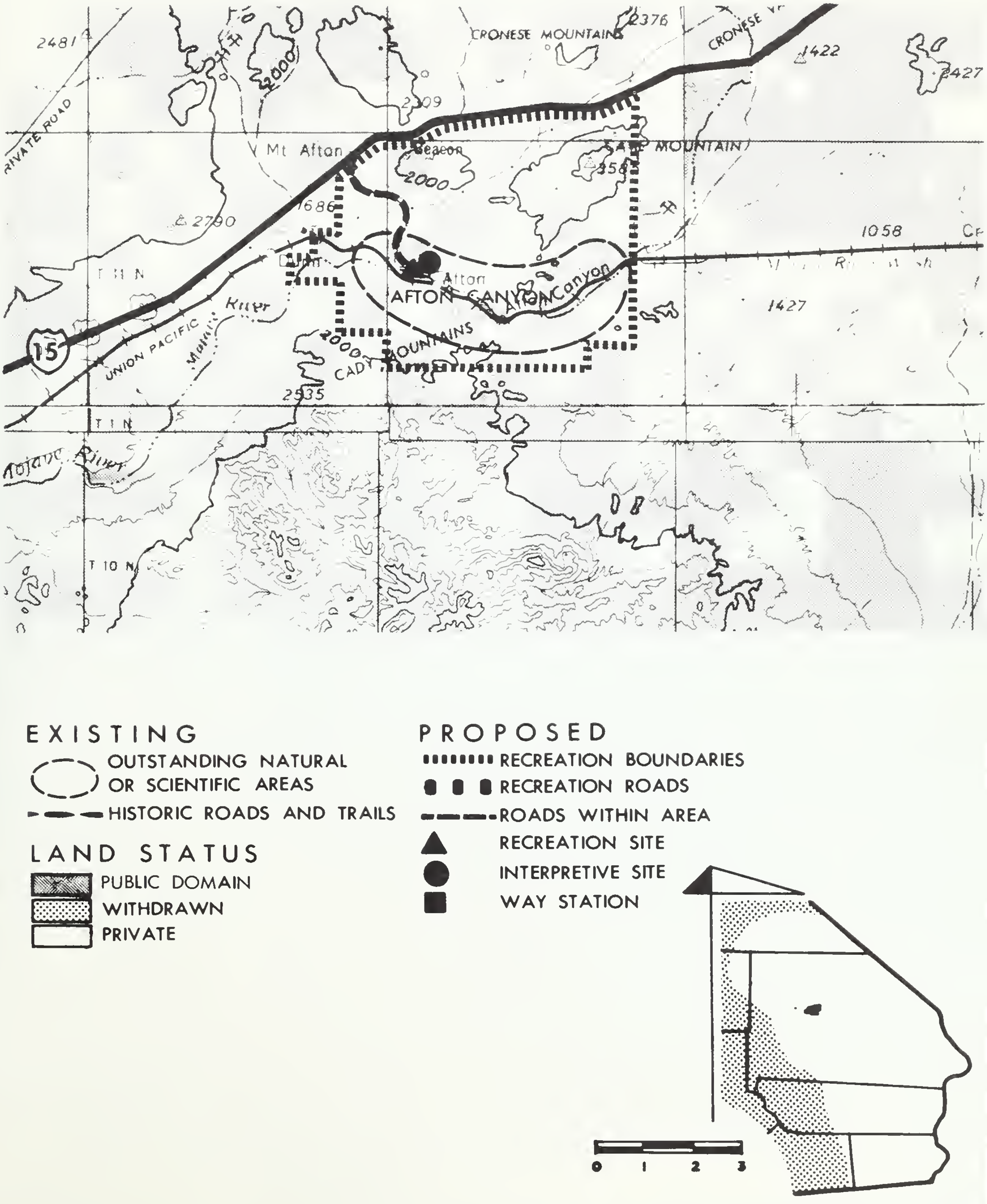
Natural and historic values are so varied and numerous in this relatively small area, the following map only indicates that these values are predominately associated with the river and the adjacent canyon walls; however, archaeological values and other values may be present throughout the area.

To conserve what remains of the biological, ecological, and historical values, only one area has been selected for development. Since the site is quite limited in size, the recreation use of this area may eventually be limited to only day use facilities.

Detailed studies of this area should be initiated as soon as possible so as to determine the location of the best remaining natural values and possible evidence of the historic routes through this area. Upon completion of these studies, one road should be selected and defined down the canyon and appropriate interpretive facilities provided along the roadway. Fortunately, the outstanding geological values are relatively undisturbed and consideration should be given to designating this area as a National Natural Landmark.

If the Bureau of Land Management can obtain public ownership of the private lands in this area, the conservation and possible restoration of the many recreational values would be immeasurably enhanced.

Eastbound travelers could avail themselves of information concerning this area at the proposed Barstow Way Station. Westbound travelers would have a similar opportunity at the proposed Cima Way Station.


CRONESE MOUNTAINS
2376
CRONESE VA
1422
2427
2481
PRIVATE ROAD
2000
2309
Mt Afton
Beacon
SAFF MOUNTAIN
2000
3558
1686
2790
1058
T 11 N
Afton
AFTON CANYON
Afton Canyon
1427
River
15
UNION PACIFIC
Mojave River
2000
CADY MOUNTAINS
2535
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EXISTING
OUTSTANDING NATURAL OR SCIENTIFIC AREAS
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RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
RECREATION SITE
INTERPRETIVE SITE
WAY STATION
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3

AFTON CANYON

BIGHORN - WHITEWATER

Priority Group II

BIGHORN - WHITEWATER RECREATION LANDS

Type of Area: Natural and Recreational

Land Status (approximate):

Public Domain	160,800 acres
Private	93,200 acres
Total	254,000 acres

Access: State Highway 18 is adjacent to the northwest end of this area and the county road from Lucerne Valley to State Highway 62 near Yucca Valley passes through the area. State Highway 62 and Interstate 10 are along the boundary for short distances in the southern extremity of this area. Numerous roads of varying quality lead into the area and at least two continue into the San Bernardino National Forest.

Observation: This area wraps around the eastern extremities of San Bernardino National Forest and the Mission Creek and Morongo Indian Reservations are adjacent to the southern end.

Above average biological and ecological values exist in this area, which ranges from a high desert environment to excellent Joshua Tree-Pinyon Pine-Juniper forests.

Mining activity has been more or less concentrated in a few areas; therefore, most of this area retains its natural qualities. Real estate developments, however, are a more serious encroachment onto the inherent recreation resources.

No recreation facilities are available and evidence indicates light to heavy use by the casual recreationist. Damage to the natural resources is concentrated around the more heavily used sites. Hunting pressures on the area are moderate to heavy for dove, quail, and rabbits. Some deer are also taken here. There is some equestrian use made of the southern reaches of this area.

Comments: The generally rugged terrain clothed in a mixed forest of Joshua Trees, Pinyon Pine, and Juniper offers a pleasing alternative to the open desert country to the north and east. Attractive sites are abundant and access is relatively easy in most cases.

The numerous access points into this area along the eastern flank of the San Bernardino Mountains suggests fine opportunities for riding or hiking trails, and good potential for hunters.

Using the Mound Spring development proposal by the Bureau of Land Management as the initial development, a series of additional sites could be developed to the northwest and south along these mountain ramparts at selected existing access roads. Connecting trails would provide varied opportunities to the rider or hiker.

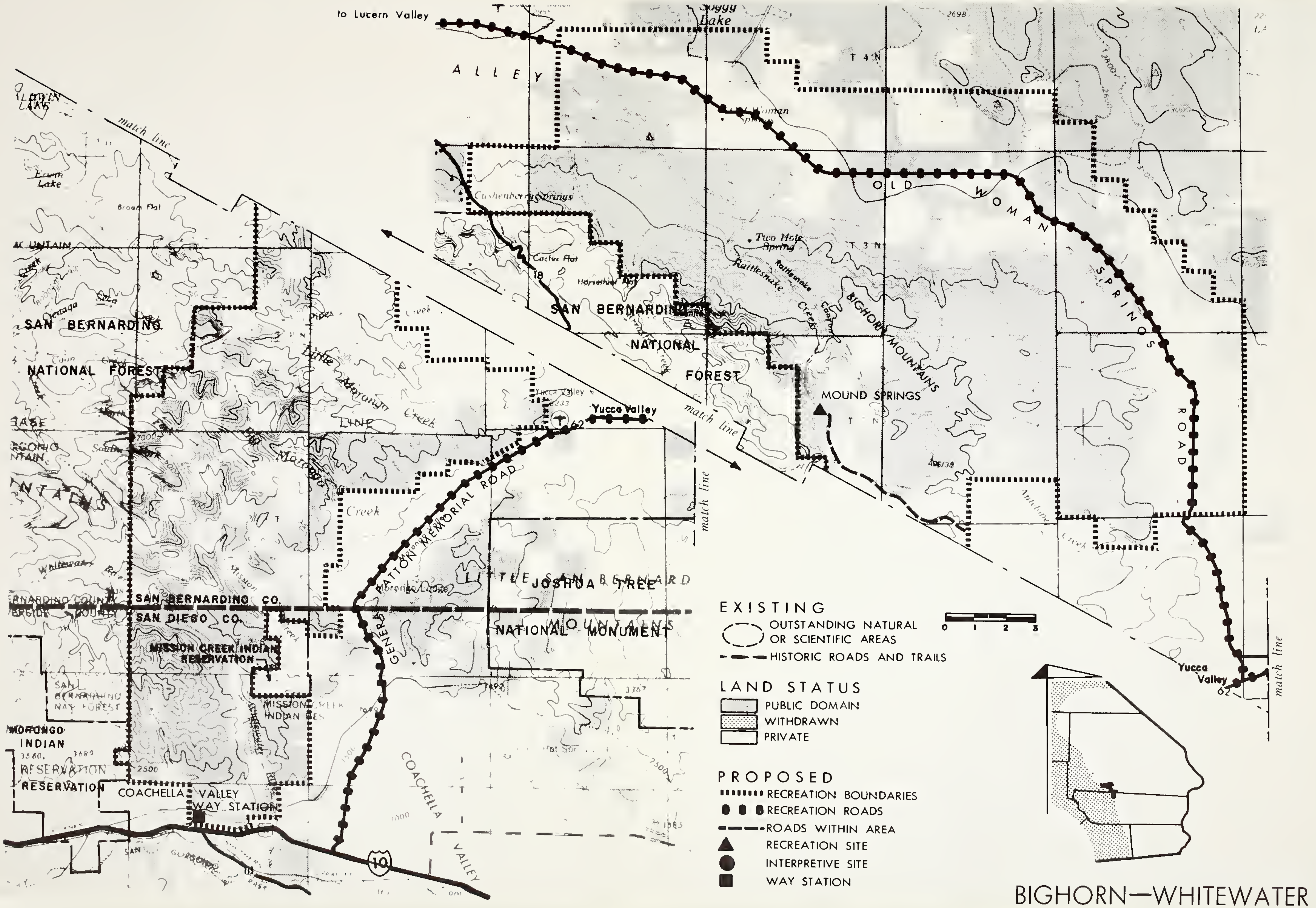
Development sites should reflect the needs and use of the recreationist as well as the capabilities of the site. That is, in some locations only parking and sanitary facilities would be provided while at others picnicking and/or camping facilities would be more appropriate. To preserve and enhance the recreation potential of these lands, elimination of the inholdings should be initiated unless the present owners are interested in providing compatible or supplemental recreation facilities.

Contributing to the recreation potential of this area is the proposed Old Woman Spring Recreation Road which connects the growing and proliferating communities to the west and north of the San Bernardino Mountains with the proposed General Patton Memorial Road or the resort communities in the Coachella Valley. Hopefully, through public ownership along this recreation road, the high desert environments against the rugged mountainous backdrop can be conserved for the enjoyment of the sightseer or traveler. Possible wayside developments along this road could be incorporated in the previously suggested series of trails connecting development sites.

As BLM proceeds with a recreation development program in this area, planning should be coordinated with the San Bernardino National Forest.

Besides eliminating inholdings, BLM should work closely with the San Bernardino and Riverside Planning Departments so that adjacent real estate developments can contribute rather than detract from the increasingly valuable recreation resources contained in the Bighorn-Whitewater Recreation Lands.

The Sunday sightseer from the Riverside-San Bernardino area could obtain information about this area from the Desert Center. The Coachella Valley resident or traveler along Interstate 10 could obtain information at the proposed Coachella Valley Way Station.


to Lucern Valley
ALLEY
match line
Soggy Lake
T 4 N
OLD WOMAN SPRINGS ROAD
Cushenbury Springs
Cactus Flat
Two Hole Spring
Rattlesnake
T 3 N
BIGHORN MOUNTAINS
SAN BERNARDINO NATIONAL FOREST
MOUND SPRINGS
Yucca Valley
62
GENERAL PATTON MEMORIAL ROAD
LITTLE SAN BERNARDINO MOUNTAINS
JOSHUA TREE NATIONAL MONUMENT
SAN BERNARDINO CO.
SAN DIEGO CO.
MISSION CREEK INDIAN RESERVATION
MORONGO INDIAN RESERVATION
COACHELLA VALLEY WAY STATION
COACHELLA VALLEY
10
Little Morongo Creek
18
EXISTING
OUTSTANDING NATURAL OR SCIENTIFIC AREAS
HISTORIC ROADS AND TRAILS
LAND STATUS
PUBLIC DOMAIN
WITHDRAWN
PRIVATE
PROPOSED
RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
RECREATION SITE
INTERPRETIVE SITE
WAY STATION
0 1 2 3

BIGHORN—WHITEWATER

CHUCKWALLA

Priority Group II

CHUCKWALLA RECREATION LANDS

Type of Area: Natural, Historical, and Recreational

Land Status (approximate):

Public Domain	306,900 acres
Private	73,200 acres
Withdrawn	5,900 acres
Total	386,000 acres

Access: The north boundary of this area is Interstate 10. State Highway 78 crosses the southeast corner. Several other unimproved, but passable roads are within the area.

Observation: The Chuckwalla, Little Chuckwalla, Mule, and Palo Verde desert mountain ranges are within the Chuckwalla Recreation Lands. The whole region is an outstanding natural area. Biological and geological values are exceptional with relatively undisturbed ecological values. Archaeological as well as historic values exist.

Camping, hunting, rockhounding, sightseeing, and photography are some of the activities enjoyed in this area. Some visitors come into the area and remain throughout the winter months, taking advantage of the climate and rockhounding opportunities. There is some accumulation of trash where campers appear to congregate. Vandals have defaced some of the petroglyphs and the activities of a few individual rockhounds have been less than commendable in some areas.

Some of the palms in the grove at Corn Springs have been mutilated; however, their survival is more dependent on soil moisture.

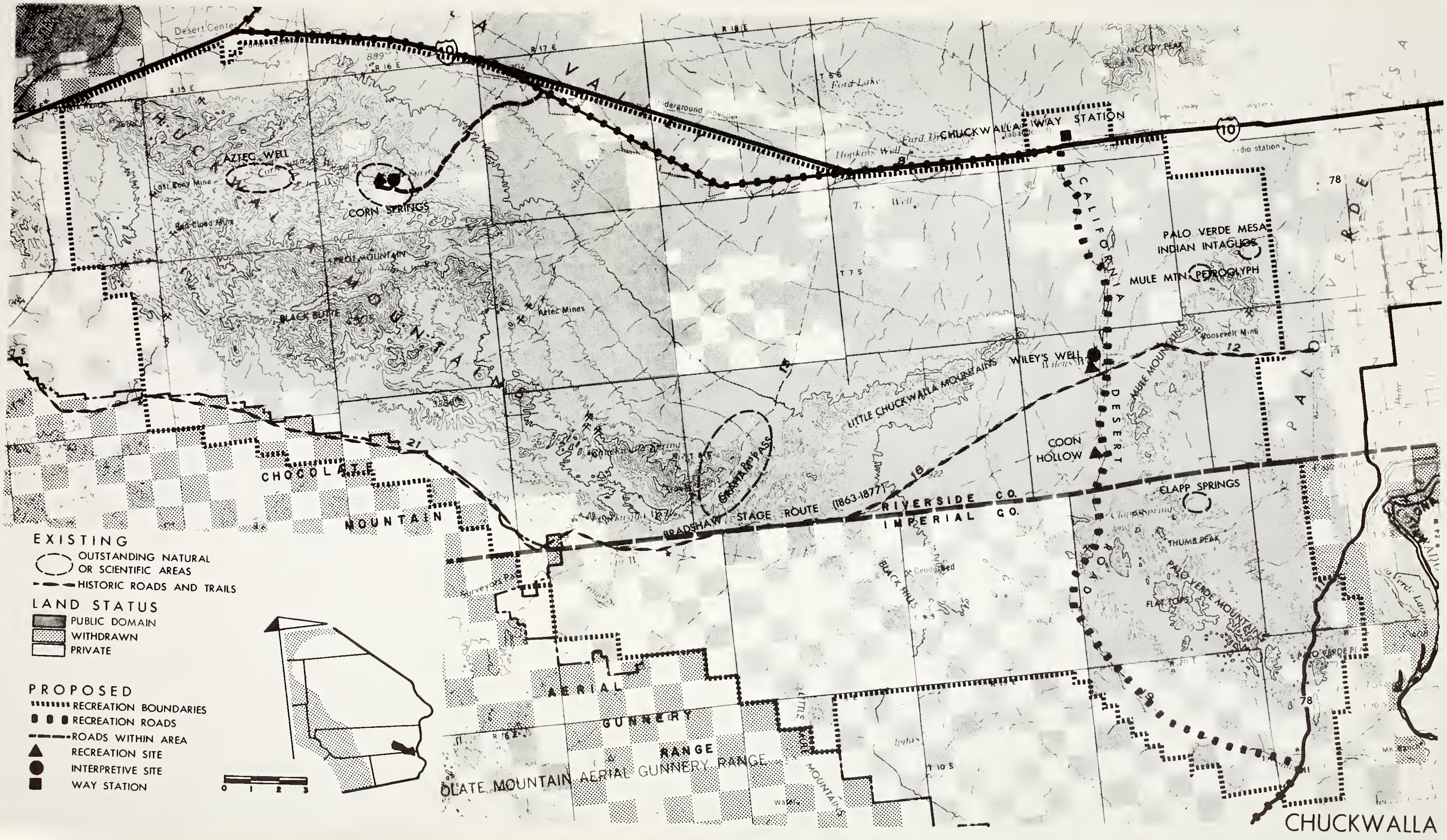
Some lethal military hardware remains in the area.

Comments: The primary objective in managing this area should be to retain the outstanding natural qualities. Proposed recreation developments at Corn Springs, Wiley's Well, and Coon Hollow should be adequate for the present needs with Clapp Spring as an additional site. Hopefully, when the Bureau of Land Management acquires rangers and maintenance men, the casual recreation use can be controlled and continued.

The proposed California Desert Road would pass through this area connecting State Highway 78 with Interstate 10 at the proposed Chuckwalla Way Station. The California Desert Road would also use the alignment of U.S. Highway 60 along the north boundary of this area. Except for the existing access to Corn Springs, no attempt was made to select an interior road system from the network of unimproved roadways within the area. However, if the Old Bradshaw Stage Route is restorable or passable from the west boundary of the area to the Coachella Valley, this provides another road access to the Chuckwalla Recreation Lands from the west. Use of this stage route through the area to Wiley's Well would make an excellent interior road along the south side of the Chuckwalla Mountains with possibilities for other recreation development sites along this route. Hopefully, the existing network of roads can be abbreviated so that large expanses of land areas can remain essentially in a primitive state.

Three areas of outstanding natural values are at Graham Pass, Corn Springs, and Aztec Well. Other areas of equal or possibly better natural values may be found when detailed studies are made of this area. An interpretive prospectus should be developed as soon as possible reflecting the abundant natural as well as archaeological and historical values within the area. Initially, the only interpretive sites suggested are at Corn Springs and Wiley's Well.

Public information concerning the Chuckwalla Recreation Lands would be made available at the proposed Chuckwalla and Imperial Sand Hills Way Stations.


Desert Center
10
CHUCKWALLA WAY STATION
AZTEC WELL
CORN SPRINGS
Lost Pony Mine
Red Cloud Mine
Aztec Mines
BLACK BUTTE
CHUCKWALLA MOUNTAINS
CHOCOLATE MOUNTAIN
GRAHAM PASS
LITTLE CHUCKWALLA MOUNTAINS
WILEY'S WELL
COON HOLLOW
CALIFORNIA DESERT ROAD
Hopkins Well
Ford Lake
Underground pipeline
McCOY PEAK
radio station
PALO VERDE MESA
PALO VERDE MESA INDIAN INTAGLIOS
MULE MTN. PETROGLYPH
MULE MOUNTAINS
Roosevelt Mine
CLAPP SPRINGS
THUMB PEAK
FLAT TOPS
PALO VERDE MOUNTAINS
78
12
13
16
21
BRADSHAW STAGE ROUTE (1863-1877)
RIVERSIDE CO.
IMPERIAL CO.
BLACK HILLS
LITTLE MULE MOUNTAINS
AERIAL GUNNERY RANGE
CHOCOLATE MOUNTAIN AERIAL GUNNERY RANGE
Surveyors Pass
T 6 S
T 7 S
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EXISTING
OUTSTANDING NATURAL OR SCIENTIFIC AREAS
HISTORIC ROADS AND TRAILS
LAND STATUS
PUBLIC DOMAIN
WITHDRAWN
PRIVATE
PROPOSED
RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
RECREATION SITE
INTERPRETIVE SITE
WAY STATION
0 1 2 3

CHUCKWALLA

EASTERN MOJAVE

Priority Group II

EASTERN MOJAVE RECREATION LANDS

Type of Area: Natural, Historical, and Recreational

Land Status (approximate):

Public Domain	734,700 acres
Private	90,300 acres
Total	825,000 acres

Access: Interstate 15 crosses the northern extremity of this area and Interstate 40 is along the southern border. A good county road, partially paved, traverses the area from north to south and affords good access.

Observation: This large area includes a variety of average to outstanding geological, biological, ecological, archaeological, and historical values.

Cima Dome and the area of cinder cones to the west are outstanding features. Also, the Joshua trees on the slopes of Cima Dome may form the finest forest of its kind in the United States.

Improved and umimproved roads make most of the area quite accessible.

Picnicking, camping, rockhounding, sightseeing, hiking, and hunting are all enjoyed in this area. Except in areas well used by recreationists, there was little litter or accumulation of trash. There is evidence of vandalism but it is not yet excessive.

Mitchell Caverns State Reserve is located in the southern portion of this area. This state development provides limited camping and picnicking facilities and guided tours through the caverns.

In essence, this scenic area retains much of its inherent qualities and the recreationists have not despoiled the area to any great extent.

Mining and grazing have made their inroads on the natural values; however, not in destructive proportions.

Comments: Geological values, in addition to the aforementioned Cima Dome and cinder cone area, are outstanding in the Providence Mountains and very good in the Castle Buttes, Hole-in-the-Wall, and Kelso Sand Dunes area.

Biological values, in addition to the outstanding forest of Joshua trees on Cima Dome, are outstanding in the Castle Buttes area. Also, the fine pinyon-juniper-sagebrush plant community in Round Valley is quite unusual for the California Desert Region. There are excellent wildlife populations in the area that provide considerable hunting for quail, chukar, rabbits, and even a few deer.

In addition to outstanding ecological study areas in the Cima Dome cinder cone area, excellent ecological values exist in the Castle Buttes and probably undisturbed ecological values occur on the top of the large inaccessible mesa south of Wildhorse Canyon. Good ecological possibilities also occur in Round Valley, the higher elevations of the Clark Mountains, and in the Providence Mountains area.

Archaeological values are evident, however, little is known about this Indian country.

In 1826, Jedediah Smith, the first American to reach California, using the Mojave Indian Trail, passed through this area enroute from the Colorado River to the Mojave River. Later, in the mid-1800's as more settlers crossed the desert, the Old Government Road, approximately following the Mojave Indian Trail, became established. To provide protection from hostile Indians, several forts were established. Although no forts were established in this area, Government Hole and Marl Springs were two regular stops along this route.

These foregoing values are only a sampling of the unusual values that are present in this large area; therefore, it behooves the Bureau of Land Management to expediously proceed with more detailed studies of this area so that other unknown or unrecognized values can be noted and protection provided before the growing recreation use despoils or destroys the inherent values. Also, consideration should be given to designating the Cima Dome, with its Joshua Tree forest, and the Cinder Cones as National Natural Landmarks.

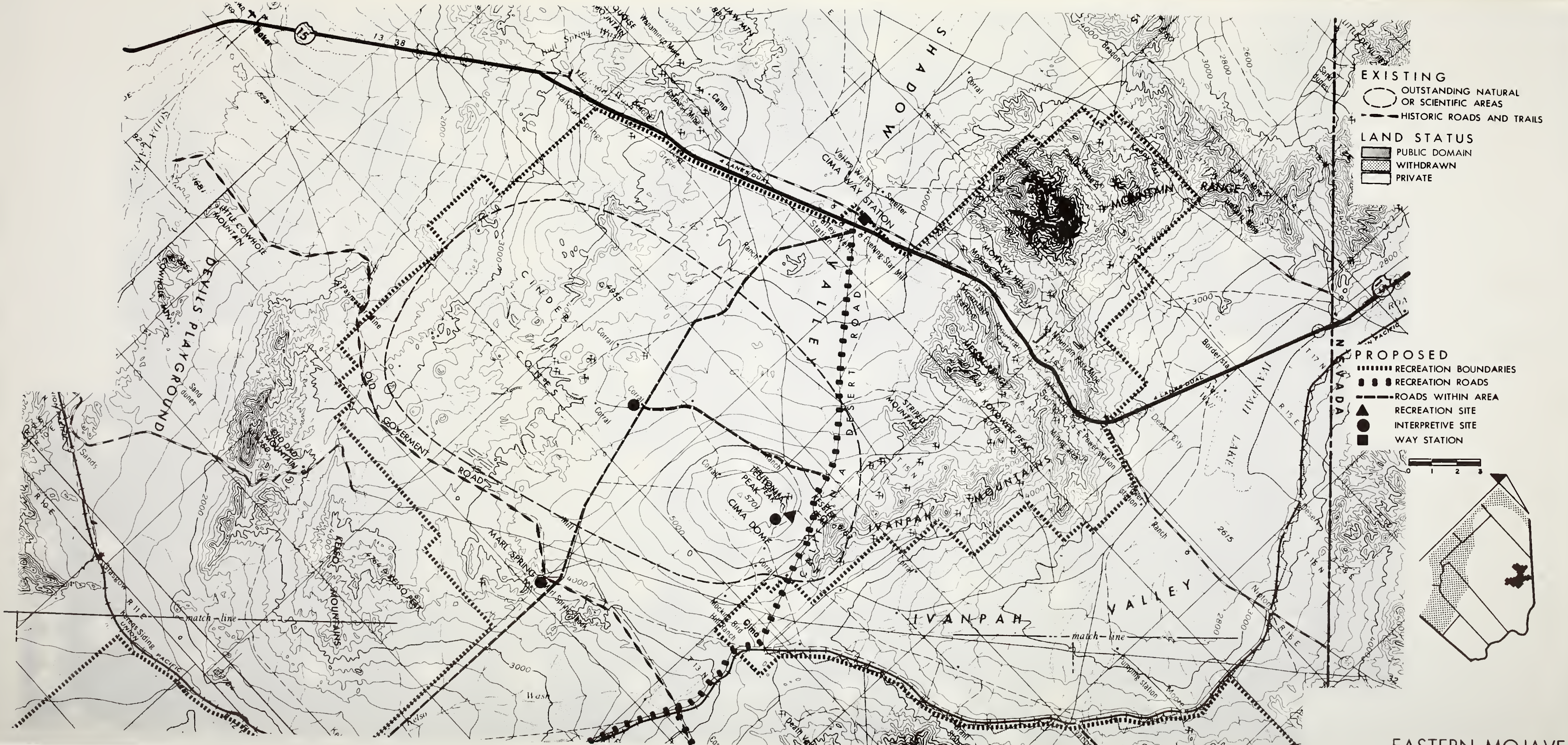
Proposed development sites are those selected by BLM which are all interesting and attractive sites now used in varying degrees by the recreationists. The Keystone Springs site is the only addition. It is suggested that initial development be at Hole-in-the-Wall, Teutonia Peak, and the Mid Hills sites. These are centrally located and quite accessible from Interstates 15 and 40. When the new alignment of Interstate 40 is completed, proposed recreation sites in Willow Springs Basin and at Budweiser Springs would be excellent wayside areas for the cross country traveler. BLM programs should be coordinated in this area with the State Highway programs so that one of the sites in Willow Springs Basin will be available upon completion of the Interstate Highway. The casual recreationist should be encouraged to use the other proposed sites which would assist BLM in its maintenance operation.

The proposed California Desert Road traverses this area. An alternate to this road is proposed which leaves the California Desert Road a few miles south of the community of Cima and travels eastward and southward to join the new Interstate 40 at the proposed Essex Way Station. A skeleton network of interior roads has been indicated on the following maps for access to proposed recreation development sites. The selection of additional existing roads can expand on this network. However, the Castle Buttes area, and there may be others, should be left roadless.

Interpretive sites have been selected at Cima Dome and at the eastern edge of the cinder cone area; at Government Hole and Marl Spring along the Old Government Road, Kelso Sand Dunes, and at Hole-in-the-Wall. Until BLM has effective protection and maintenance forces, other interpretive sites, of which there are many, should not be developed.

BLM should proceed at the earliest opportunity with the elimination of the private inholdings and incompatible uses within areas having unusual and outstanding natural values.

An opportunity to provide the public with information concerning this area would be available at the proposed Cima and Essex Way Stations. Since no Way Station is proposed at the crossing of the California Desert Road and Interstate 40, eastbound travelers from the Los Angeles area and central California should be able to gain information about this area at the proposed Barstow Way Station.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WAY STATION
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15
SHADOW MOUNTAIN RANGE
CIMA WAY STATION
DEVILS PLAYGROUND
CINDER CONES
OLD GOVERMENT ROAD
MARL SPRING
CIMA DOME
TEUTONIA PEAK
VALLEY
DESERT ROAD
STRIPED MOUNTAIN
KOKOWEEF PEAK
IVANPAH MOUNTAINS
IVANPAH VALLEY
KELSO MOUNTAINS
OLD DAD MOUNTAIN
LITTLE COWHOLE MOUNTAIN
COWHOLE MTN
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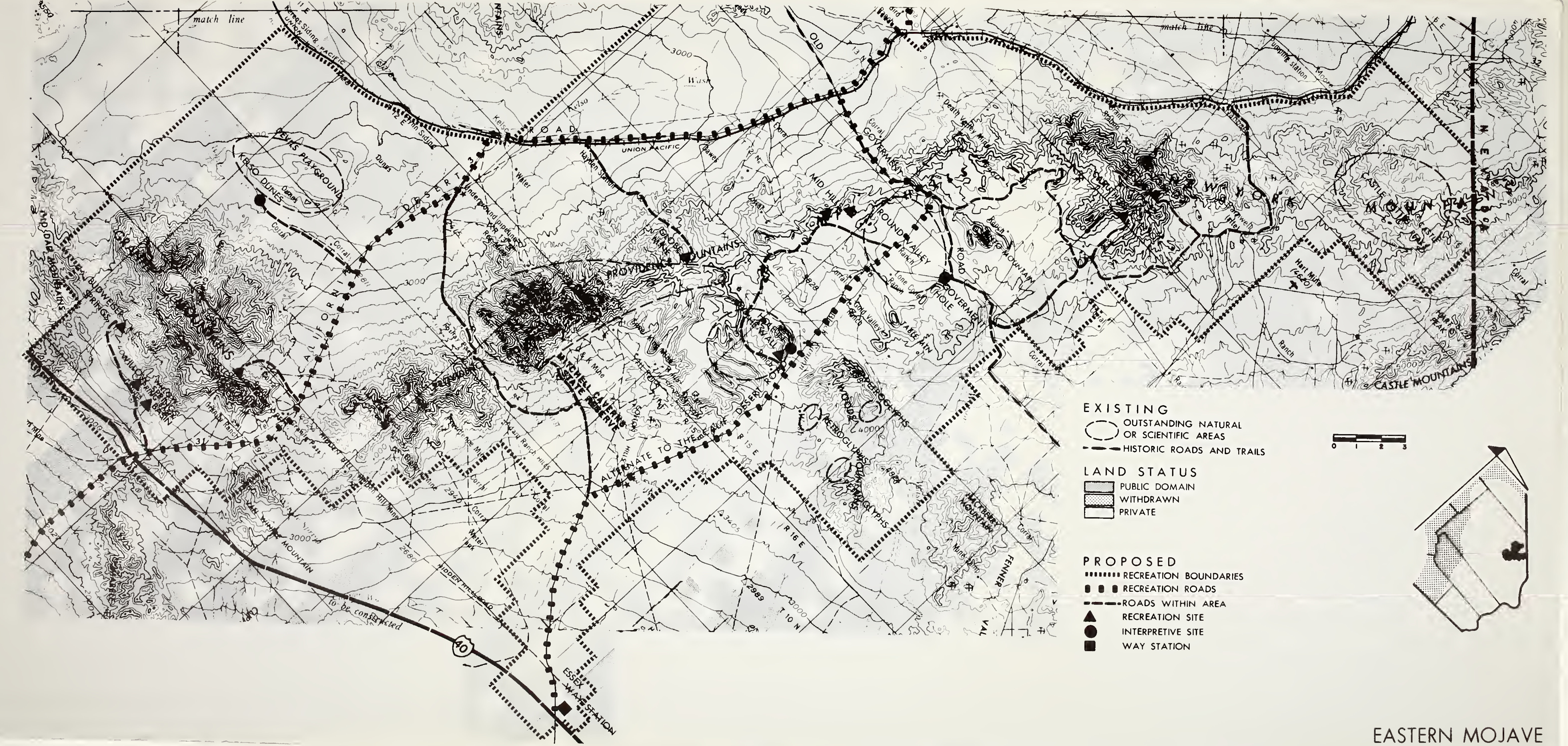
Kelso
UNION PACIFIC

EASTERN MOJAVE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UNION PACIFIC
KELSO ROAD
OLD GOVERNMENT ROAD
KELSO DUNES
DEVILS PLAYGROUND
DESERT CALIFORNIA
GRANITE MOUNTAINS
BUDWEISER SPRINGS
PROVIDENCE MOUNTAINS
MITCHELL CAVERNS STATE RESERVE
MID HILLS
ROUND VALLEY
HOLE IN THE WALL
GOVERNMENT HOLE
TABLE MTN
NEW YORK MOUNTAINS
CASTLE MOUNTAINS
PETROGLYPHS
WOODS MOUNTAINS
HACKBERRY MOUNTAIN
FENNER VALLEY
ALTERNATE TO THE DESERT ROAD
HIDDEN HILL ROAD
to be constructed
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ESSEX WAY STATION
Kelso
Cima
Hart Mine
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RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
▲ RECREATION SITE
● INTERPRETIVE SITE
■ WAY STATION
0 1 2 3

EASTERN MOJAVE

GRAPEVINE CANYON

Priority Group II

GRAPEVINE CANYON RECREATION LANDS

Type of Area: Natural and Recreational

Land Status (approximate):		
	Public Domain	22,300 acres
	Private	5,700 acres
	Total	28,000 acres

Access: Several unimproved roads lead into the area from State Highway 18 which parallels the area a few miles to the north.

Observations: The rugged northern flanks of the San Bernardino Mountains are in this area of the desert Public Domain. Vegetation ranges from dense pinyon forests to the high desert flora community.

Mining activity has scarred these slopes; however, public ownership has generally preserved this southern backdrop of the Apple and Lucerne Valleys.

There is a moderate amount of camping, hiking, hunting, and picnic use. Hunting use in the area features chukar, all three species of quail, dove, rabbits, and a few deer. Unobstructed views of tremendous desert expanses to the north and the numerous communities in the Apple and Lucerne Valleys are common.

Comment: The Pinyon Pine forests, extending down from the neighboring San Bernardino National Forest, are a pleasing added attraction to the desert scenery and invite picnicking and camping use.

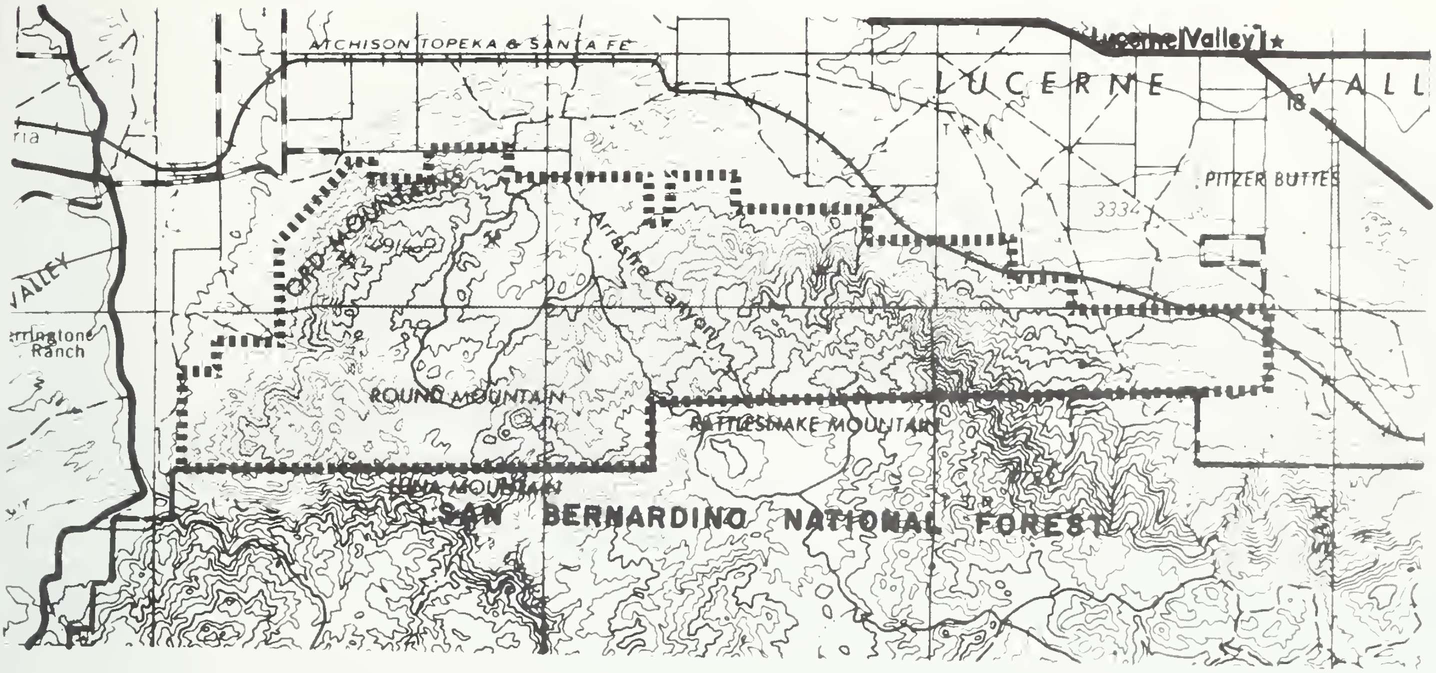
Several unimproved roads cross the Grapevine Canyon Recreation Lands and many attractive development sites are available in both the Bureau of Land Management area and the National Forest. Therefore, since selection of roads to be improved or sites to be developed should reflect the recreation program of both BLM and the U.S. Forest Service, it would be presumptuous to select sites for development at this time.

There is no doubt that the growing urban areas immediately to the north and west will use any recreation developments provided. Also, these northern flanks of the San Bernardino Mountains are more inviting to the campers and picnickers, especially during the summer months, than the Rodman Mountains Recreation Lands to the north.

As cooperative planning proceeds in this area, consideration should be given to hiking and riding trails. The numerous access points and view points along this northern flank of the San Bernardino Mountains together with the boulder strewn slopes and pinyon forests suggest excellent opportunities for east-west hiking and riding trails. Cooperative planning should also be mindful of the scenic qualities of this area as a backdrop to the communities to the north; therefore, construction scars should be kept to a minimum.

The Grapevine Canyon Recreation Lands contain scattered private inholdings. To preserve and enhance the recreation potential of these lands, elimination of these inholdings should be initiated unless the present owners are interested in providing compatible or supplemental recreation facilities.

Information concerning the recreational opportunities in this area would be available at the Desert Center near San Bernardino or the proposed Barstow Way Station.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Lucerne Valley
LUCERNE VALL
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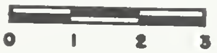
ROUND MOUNTAIN
RATTLESNAKE MOUNTAIN
LUNA MOUNTAIN
SAN BERNARDINO NATIONAL FOREST



LAND STATUS

▨ PUBLIC DOMAIN

▒ WITHDRAWN

☐ PRIVATE

PROPOSED

▪▪▪▪▪▪▪▪ RECREATION BOUNDARIES

GRAPEVINE CANYON

PICACHO

Priority Group II

PICACHO RECREATION LANDS

Type of Area: Natural, Historical, and Recreational

Land Status (approximate):

Public Domain	128,000 acres
Private	12,500 acres
Withdrawn	13,500 acres
Total	154,000 acres

Access: The majority of the present access is via a graveled road from Winterhaven (U.S. 80) leading to the Picacho State Park on the Colorado River.

Observations: This rugged area of broad washes, dominated by Picacho Peak, has above average scenic qualities; and the natural, biological, ecological, and geological values are relatively undisturbed. The hunting of dove, quail, cottontail, a few deer, and waterfowl along the river is an important recreation use in Picacho. The Picacho State Recreation Area provides camping facilities and boating access to the Colorado River.

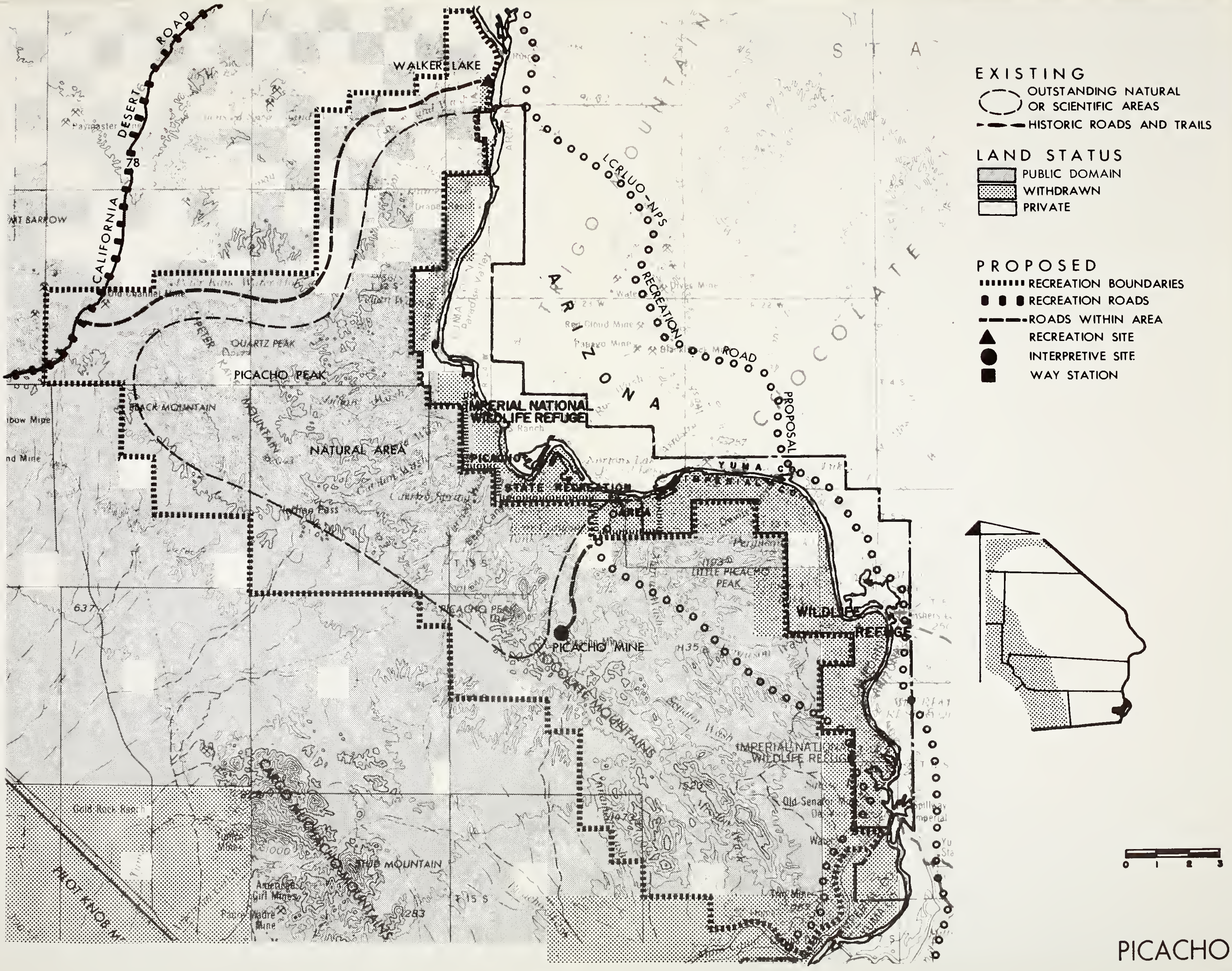
Comments: The primary objective in managing this area should be to retain its primitive natural characteristics. As the demand for recreation facilities increases, limited day use and interpretive facilities should be developed. However, the Picacho State Recreation Area is the logical location for the expansion of major overnight developments. Future recreation developments should also consider the Walker Lake area near the north end of the Picacho Recreation Lands.

The parkway proposal by the Lower Colorado River Land Use Office and the National Park Service suggests access to the Picacho State Recreation Area from the vicinity of Imperial Dam on the Colorado River. This access route would be adequate and provide many opportunities for casual recreation uses somewhat removed from the proposed Picacho Peak Natural Area. Future developments in the vicinity of Walker Lake would be accessible by a road from State Highway 78 (California Desert Road) along the north boundary of the Picacho Recreation Lands.

The large Picacho Peak Natural Area shown on the following map would be accessible by trail or by the few existing jeep roads. This generally roadless area would provide the public as well as the student or scientist ample opportunities to enjoy and study a variety of natural values. This use should not conflict with present wildlife management agreements.

Interpretive possibilities are good in the fields of biology, ecology, and geology and an interpretive prospectus should be developed. When the Bureau of Land Management acquires personnel to protect and maintain their investments, there are unlimited opportunities for more sophisticated interpretive devices. For instance, the Picacho Mine was developed because of the rich gold lodes. Therefore, it is suggested that the north portion of the existing access road be retained as access to the Picacho Mine--a subject of historical interest.

The proposed Imperial Sand Hills Way Station would make information concerning this area available to the public. The westbound traveler would obtain information from a possible Way Station that could be located to the east in Arizona.


EXISTING
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RECREATION BOUNDARIES
RECREATION ROADS
ROADS WITHIN AREA
RECREATION SITE
INTERPRETIVE SITE
WAY STATION
CALIFORNIA DESERT ROAD
78
WALKER LAKE
PICACHO PEAK
QUARTZ PEAK
BLACK MOUNTAIN
PETER KANE MOUNTAIN
NATURAL AREA
IMPERIAL NATIONAL WILDLIFE REFUGE
PICACHO STATE RECREATION AREA
LITTLE PICACHO PEAK
PICACHO MINE
CHOCOLATE MOUNTAINS
CARGO MUCHACHO MOUNTAINS
STUD MOUNTAIN
WILDLIFE REFUGE
PILOT KNOB MESA
Gold Rock Ranch
ARIZONA
TRIGO MOUNTAIN
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PICACHO

SANTA ROSA MOUNTAINS

Priority Group II

SANTA ROSA MOUNTAINS RECREATION LANDS

Type of Area: Natural, Historical, and Recreational

Land Status (approximate):	Public Domain	57,000 acres
	Private	66,000 acres
	Total	123,000 acres

Access: A few miles south of Palm Desert, State Highway 74 crosses the northern end of this area and a few trails and jeep roads provide limited access into the area.

Observations: From State Highway 74 spectacular views of the Coachella Valley are available to the sightseer. There is riding, hiking, and hunting. The State of California has designated part of the area as a Bighorn Sheep Refuge, while on other parts of the area upland game birds and deer are hunted.

The rugged Santa Rosa Mountains immeasurably enhance the environment of the agricultural and resort communities in the Coachella Valley. However, the scars of our civilization are creeping up the lower slopes, resulting in some littering and vandalism.

Comments: These rugged mountains were once inhabited by Cahuilla Indian bands and ruins of their communities are still evident. Scattered groves of native fan palms occur near existing springs.

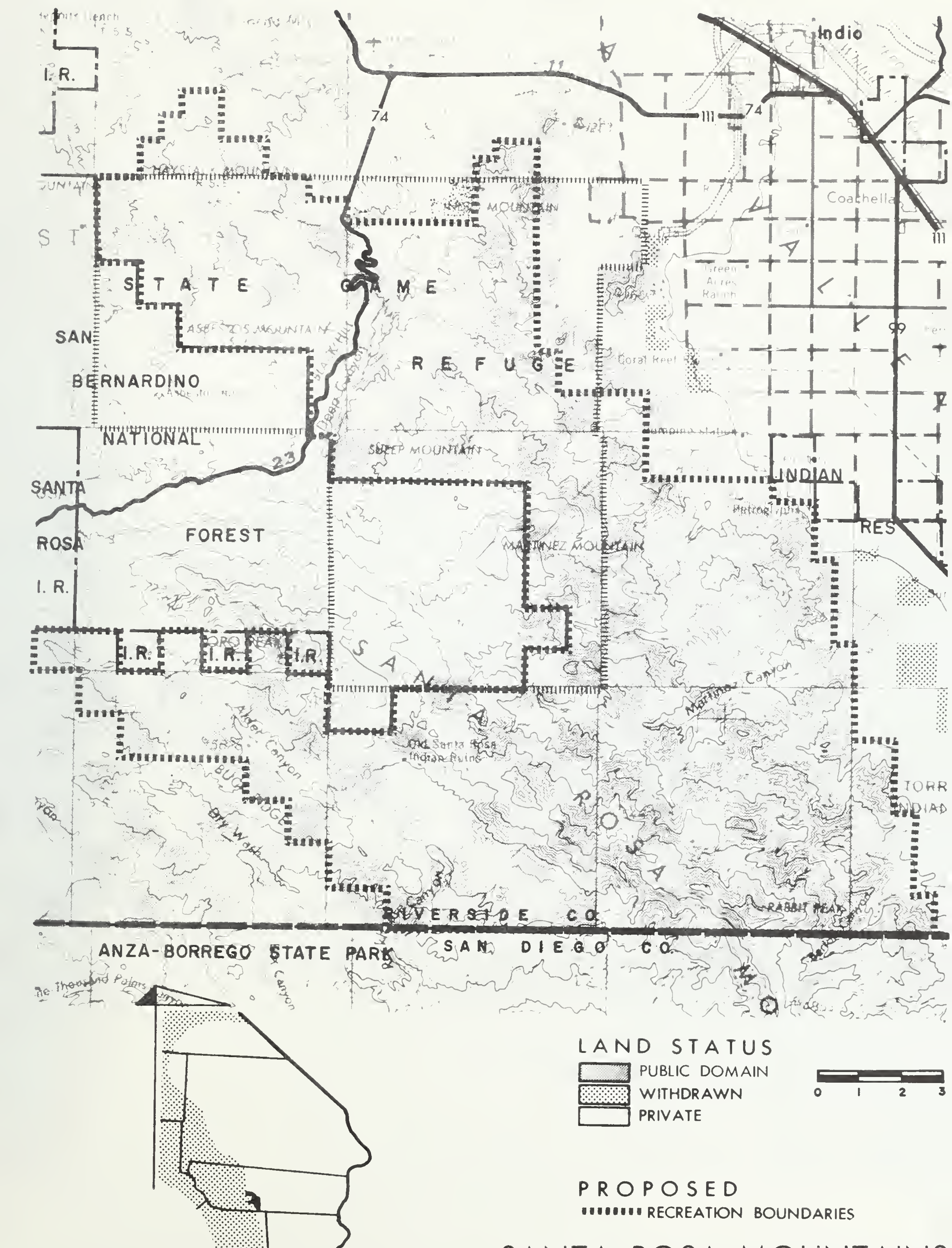
This area wraps around the eastern extremities of the southern extension of San Bernardino National Forest, and the Anza-Borrego State Park is immediately to the south.

No recreation developments are proposed at this time since facilities are available in the San Bernardino National Forest; however, the Bureau of Land Management should provide trash receptacles at the trail heads. No roads are proposed but some trail improvement may be warranted.

Efforts of BLM should be directed toward eliminating the existing checkerboard land pattern and protecting the natural and historic values such as the native fan palm groves and Indian ruins.

Although this area provides outstanding recreational and educational opportunities to the hiker, it also has great value in the spectacular natural backdrop this area provides the growing resort and agricultural communities in the Coachella Valley. Many recognize and appreciate this value but unfortunately, it is difficult to measure in economic terms.

The public would be able to acquire detailed information about this area from the Coachella Valley Way Station.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STATE GAME REFUGE
SAN BERNARDINO NATIONAL FOREST
SANTA ROSA I. R.
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Asbestos Mountain
Sheep Mountain
Martinez Mountain
Martinez Canyon
Deep Canyon
Green Acres Ranch
Coral Reef
INDIAN RES
TORR INDIAN
Old Santa Rosa Indian Ruins
Toro Peak
Alder Canyon
Rabbit Peak
SANTA ROSA
RIVERSIDE CO
SAN DIEGO CO.
ANZA-BORREGO STATE PARK
Thousand Palms Canyon
LAND STATUS
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PROPOSED
RECREATION BOUNDARIES

SANTA ROSA MOUNTAINS

TUFA PINNACLES

Priority Group II

TUFA (TRONA) PINNACLES RECREATION LANDS

Type of Area: Natural

Land Status (approximate):		
	Public Domain	11,000 acres
	Total	11,000 acres

Access: State Highway 178 is about six miles northwest of the Tufa Pinnacles and access to the area is by an unimproved road.

Observations: These pinnacles, confined to a small area along the south shoreline of an ancient lake, are unique and the most impressive example of tufa castles in North America. These tufa formations are attributed to algae precipitating calcium carbonate carried by fresh water springs into slightly saline lake waters. The area has been designated as a National Natural Landmark.

The area around these pinnacles is cross-hatched by roads and even a prospect tunnel has been dug into the center of one castle.

Casual recreation use is made of this area by sightseers, picnickers, rockhounds, and campers. Because of the openness of the area, wind has blown away some of the litter and trash. Vandalism is evident, resulting in the defacing of a few pinnacles.

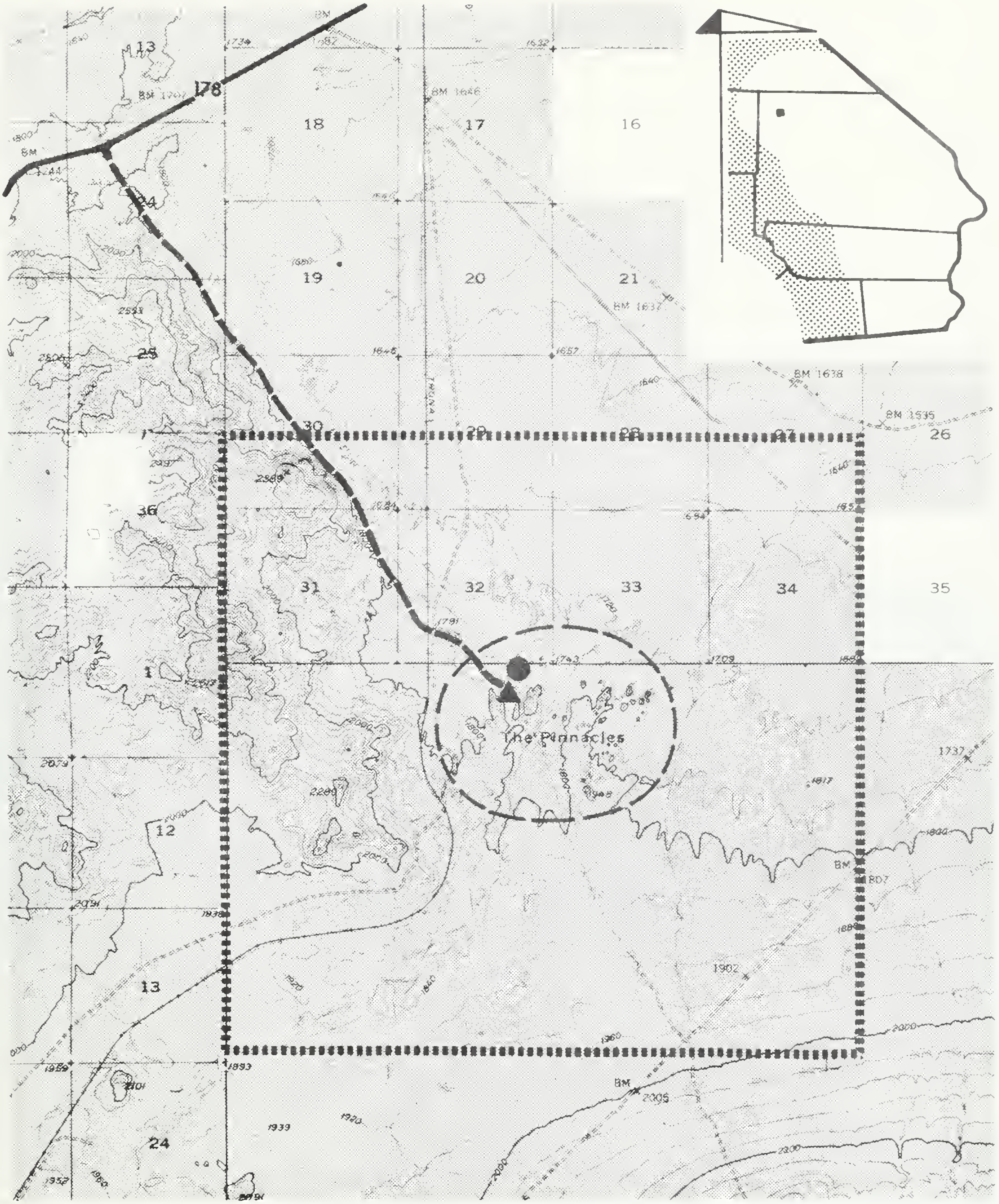
A railroad leading to Trona passes about a quarter of a mile west of the pinnacles.

Comments: Except from the west, these pinnacles can be seen for miles; however, to retain some of their natural setting, about 16 square miles of land surrounding the pinnacles should be set aside and where possible all surface use of the land terminated. All roads except the designated access road should be blocked.

Recreation developments should be restricted to one area wherein parking and sanitary facilities would be provided initially. As recreation use increases, ramadas for picnickers and interpretive devices should be added.

An improved access road to the area should be built to the southeast along the shore of the ancient lake from State Highway 178. It is doubtful whether a railroad overpass or underpass would be needed, at least not in the foreseeable future.

Information regarding these pinnacles would be available at the proposed Mojave and Barstow Way Stations as well as the proposed Desert Center near San Bernardino. The proposed Way Station at Lathrop Wells, Nevada, and any Way Station proposed north of Lone Pine on U.S. 395 should provide information regarding the Tufa Pinnacles.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The Pinnacles
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EXISTING

◯ OUTSTANDING NATURAL OR SCIENTIFIC AREAS

— — HISTORIC ROADS AND TRAILS

LAND STATUS

▭ PUBLIC DOMAIN

▨ WITHDRAWN

☐ PRIVATE

PROPOSED

▮▮▮▮▮▮▮ RECREATION BOUNDARIES

▮ ▮ ▮ RECREATION ROADS

— — — ROADS WITHIN AREA

▲ RECREATION SITE

● INTERPRETIVE SITE

■ WAY STATION

TUFA (TRONA) PINNACLES

FORT PIUTE

Priority Group II

FORT PIUTE RECREATION LANDS

Type of Area: Historical

Land Status (approximate):

Public Domain	5,800 acres
Private	200 acres
Total	6,000 acres

Access: Access to the area is along the unimproved Old Government Road from U.S. Highway 95 eight miles to the east.

Observations: The Mojave Indian Trail followed by Jedediah Smith and later the route of the Old Government Road passes through this area. Fort Piute was one of the forts established along this route in the early 1860's to provide protection to the settlers from the hostile Indians. Although it was not a complete military establishment, this outpost provided relief for the soldiers and their mounts while on patrol.

Today, only the ruins remain; however, the type and size of the structure is easily discernible.

Natural values are only average although Piute Spring and the stream from it may present biological and ecological values worth further study. There are petroglyphs in the area and other archaeological values are known to exist.

Casual camping, picnicking, and off-road vehicular use is enjoyed in the area. Since this use is apparently small, the area is relatively clean and vandalism is minimal.

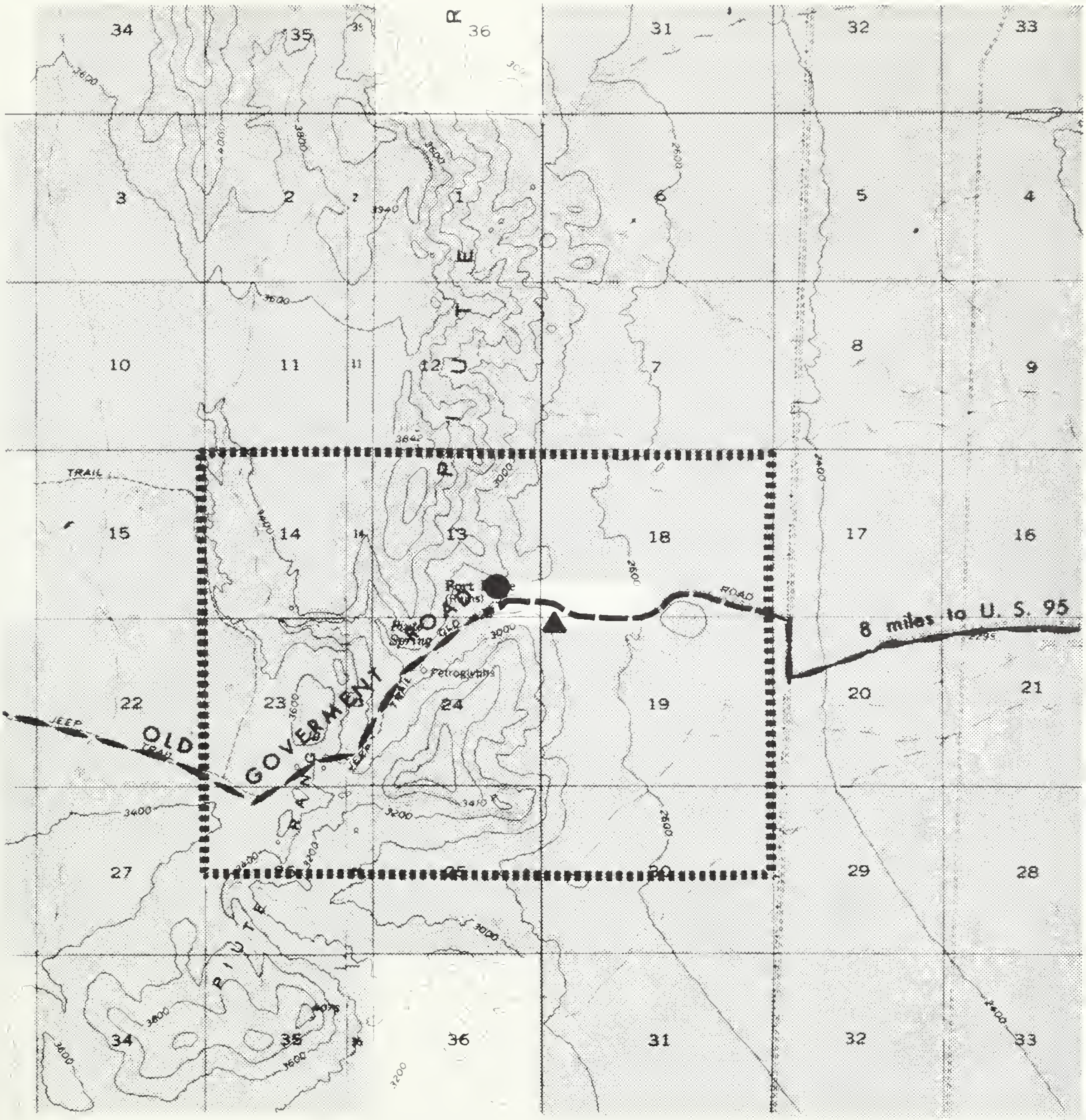
Approach to the ruins is now through a private inholding and the land is used for grazing.

Comments: This old fort deserves protection and possibly some restoration since it may be the only remaining one along this historic route. The setting, with particular emphasis on vegetation, should have the opportunity to recover to its natural state.

Since the present recreation use is small, only trash receptacles, sanitary facilities, and a defined area for camping and picnicking should be provided. As public interest in this area increases, additional facilities may be needed. Any interpretation facilities should be quite modest until the Bureau of Land Management can provide adequate protection of this area.

In order to restore the original setting of this area, overnight visitor use, along with livestock grazing, should be excluded. Since there appears to be sufficient water in the stream for public recreation use and for the stock grazed in the vicinity, water should be diverted to stock-watering facilities outside the area. The private inholding straddling the approach to the fort should be acquired for public use and enjoyment.

The proposed Essex Way Station could provide information concerning this area for eastbound travelers. If a system of Way Stations is developed in Nevada or Arizona, information concerning this area would be made available to the westbound or southbound traveler.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PIUTE RANGE
OLD GOVERMENT ROAD
JEEP TRAIL
TRAIL
ROAD
Fort Piute (Ruins)
Piute Spring
Petroglyphs
8 miles to U. S. 95
3600
3400
3200
3000
2800
2600
2400
3842
3940
0
1/2
1

EXISTING

◯ OUTSTANDING NATURAL OR SCIENTIFIC AREAS

▬ ▬ HISTORIC ROADS AND TRAILS

LAND STATUS

▨ PUBLIC DOMAIN

▨ WITHDRAWN

☐ PRIVATE

PROPOSED

▮▮▮▮ RECREATION BOUNDARIES

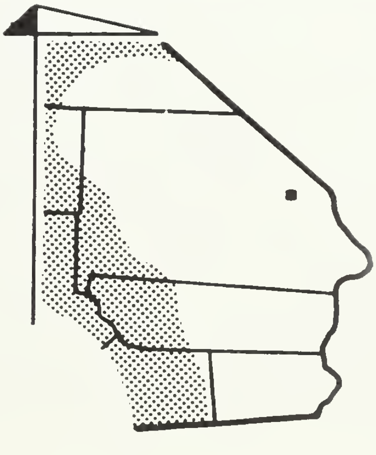
● ● ● RECREATION ROADS

▬▬▬ ROADS WITHIN AREA

▲ RECREATION SITE

● INTERPRETIVE SITE

■ WAY STATION



FORT PIUTE

KINGSTON PEAK

Priority Group III

KINGSTON PEAK RECREATION LANDS

Type of Area: Natural, Historical, and Recreational

Land Status (approximate):

Public Domain	11,000 acres
Private	1,000 acres
Total	12,000 acres

Access: State Highway 127 lies several miles to the west; however, there is improved access to the several operating mines near the north perimeter of the area.

Observations: This rugged mountain area provides average natural values. Archaeological values exist. There is considerable scarring of the desert scenery to the north by mining and prospecting; however, this has been extreme along the northern perimeter of the area.

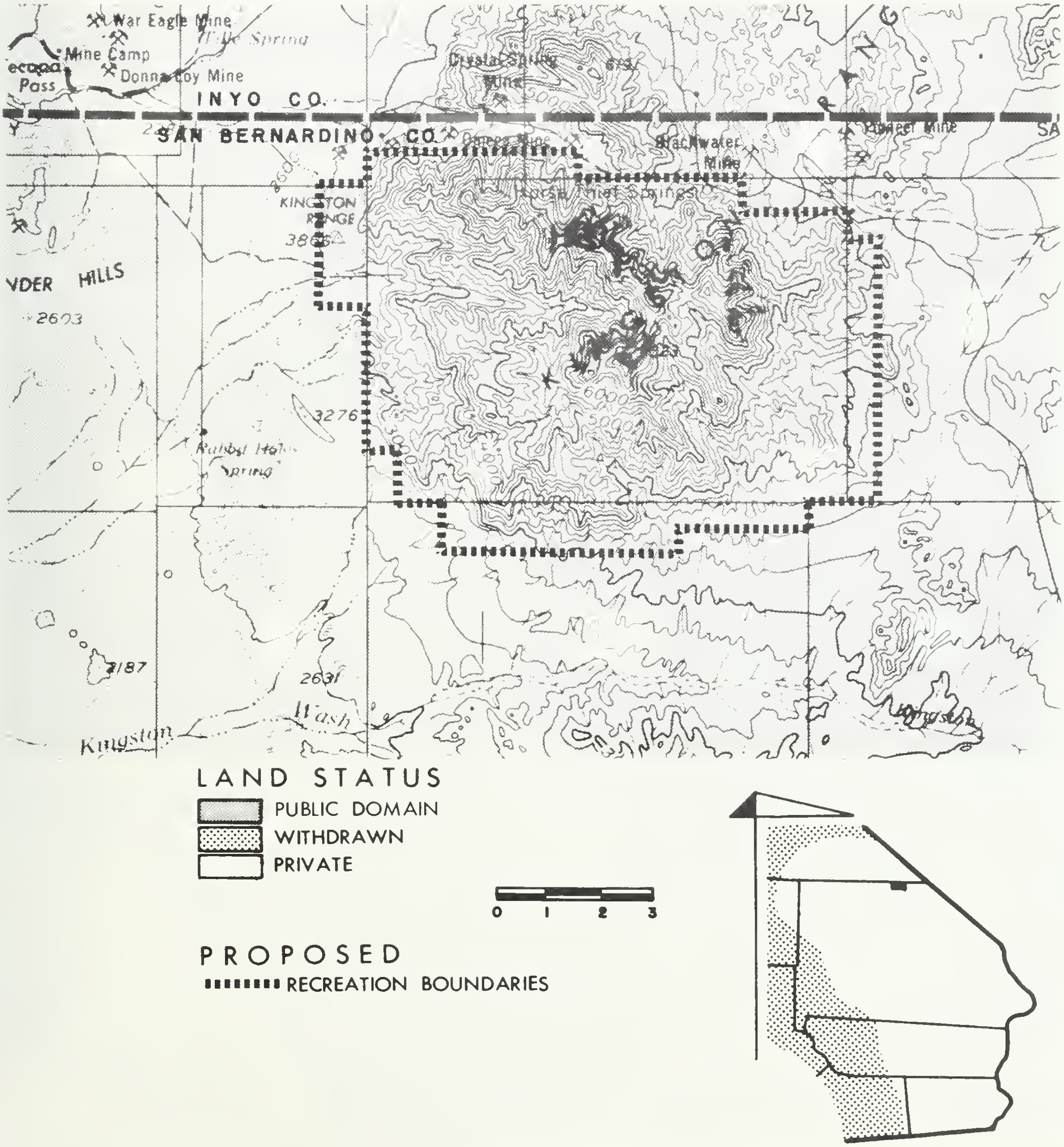
Evidently, there is not extensive recreation use yet, although some upland game hunting does take place along with limited hiking and riding.

Comments: The time will come when the public will be searching out the Kingston Range for recreational opportunities and the area should be conserved for that purpose. Although there are several attractive recreation sites along the rugged north slopes of these mountains, no developments are proposed at this time.

Several operating mines are near the north boundary of this area so good access is available. An unimproved road from the proposed location of the Cima Way Station skirts this mountain range on the east and jeep roads penetrate the southern and western boundary.

Non-Federal inholdings, mostly school sections, should be acquired and any further encroachments by mining activity should be evaluated in reference to the recreation program.

The proposed Cima Way Station and the proposed Lathrop Wells Way Station in Nevada would provide information concerning this area.


War Eagle Mine
Mine Camp
Donna Loy Mine
Pass
INYO CO.
SAN BERNARDINO CO.
Crystal Spring Mine
Blackwater Mine
Horse Thief Springs
Pioneer Mine
KINGSTON RANGE
3866
HILLS
2603
3276
Rabbit Hole Spring
3187
2631
Kingston
Wash
LAND STATUS
PUBLIC DOMAIN
WITHDRAWN
PRIVATE
0
1
2
3
PROPOSED
RECREATION BOUNDARIES

KINGSTON PEAK

OLD WOMAN MOUNTAINS

Priority Group III

OLD WOMAN MOUNTAINS RECREATION LANDS

Type of Area: Recreational

Land Status (approximate):

Public Domain	83,000 acres
Private	33,000 acres
Total	116,000 acres

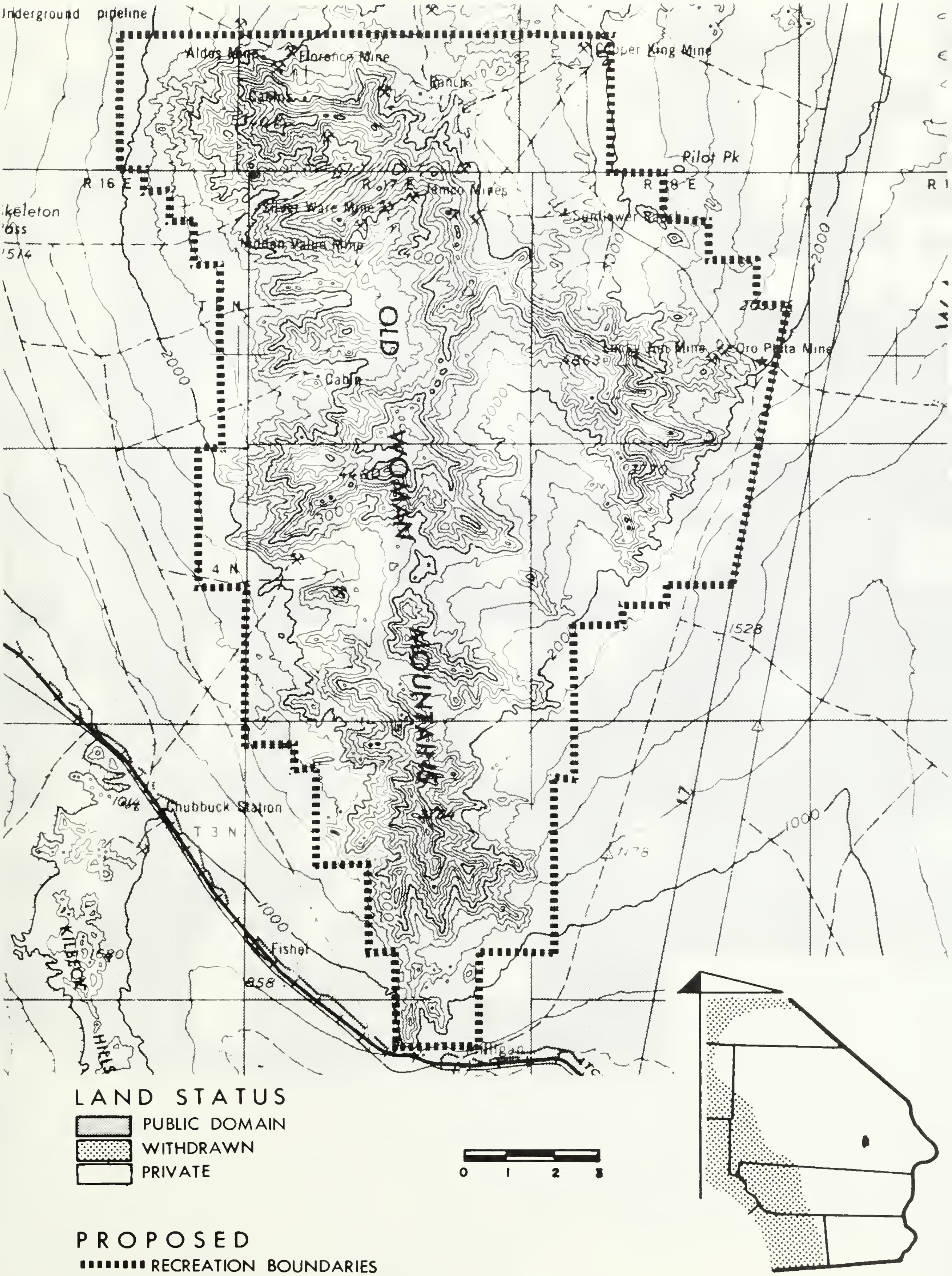
Access: The northeast corner of this area is about 14 miles south by unimproved road from the community of Essex on U.S. Highway 66.

Observations: Biological and geological values appear to be average; however, ecological values are good in some of the undisturbed washes. Archaeological values exist and considerable mining and prospecting have been carried out in this area. Casual camping has been enjoyed in the more attractive areas or near the springs. Hunting of upland game birds is increasing.

Comments: Casual recreation use can be continued in this area until future recreation demands warrant greater investments in recreation facilities. The Bureau of Land Management should, however, designate areas for this use, particularly in the northeast portion of this area. Trash receptacles and sanitary facilities should also be provided as needed.

In preparation for the potential recreation use of this area, efforts should be directed toward eliminating the checkerboard land pattern with particular emphasis on public ownership of the springs and the more attractive areas. Also, elimination of the hazards associated with the mining activity must be pursued.

The proposed Essex Way Station on Interstate 40 would provide public information for this area.


Underground pipeline
Aldos Mine
Florence Mine
Copper King Mine
Ranch
Cabins
Pilot Pk
R 16 E
R 17 E
R 18 E
Skeleton Pass
1514
Silver Ware Mine
Hidden Value Mine
Tamco Mines
Sunflower
T N
OLD
WOMAN
MOUNTAINS
Cabin
Oro Plata Mine
4863
2000
3000
4 N
1528
Chubbuck Station
T 3 N
1000
1178
Fishel
858
KILBECK HILLS
LAND STATUS
PUBLIC DOMAIN
WITHDRAWN
PRIVATE
0 1 2 3
PROPOSED
RECREATION BOUNDARIES

OLD WOMAN MOUNTAINS

TURTLE MOUNTAINS

Priority Group III

TURTLE MOUNTAINS (MOPAH PEAKS) RECREATION LANDS

Type of Area: Natural, Historical, and Recreational

Land Status (approximate):

Public Domain	93,000 acres
Private	4,000 acres
Total	97,000 acres

Access: Access is from unimproved roads leading from U.S. Highway 95 along the east boundary of the area.

Observations: These highly scenic mountains are accentuated by the twin Mopah Peaks. Pinnacles, canyons, and broad washes dominated by massive lava flows complete this splendid example of desert scenery. Geological values are outstanding while biological and ecological values are exceptional. Archaeological values exist.

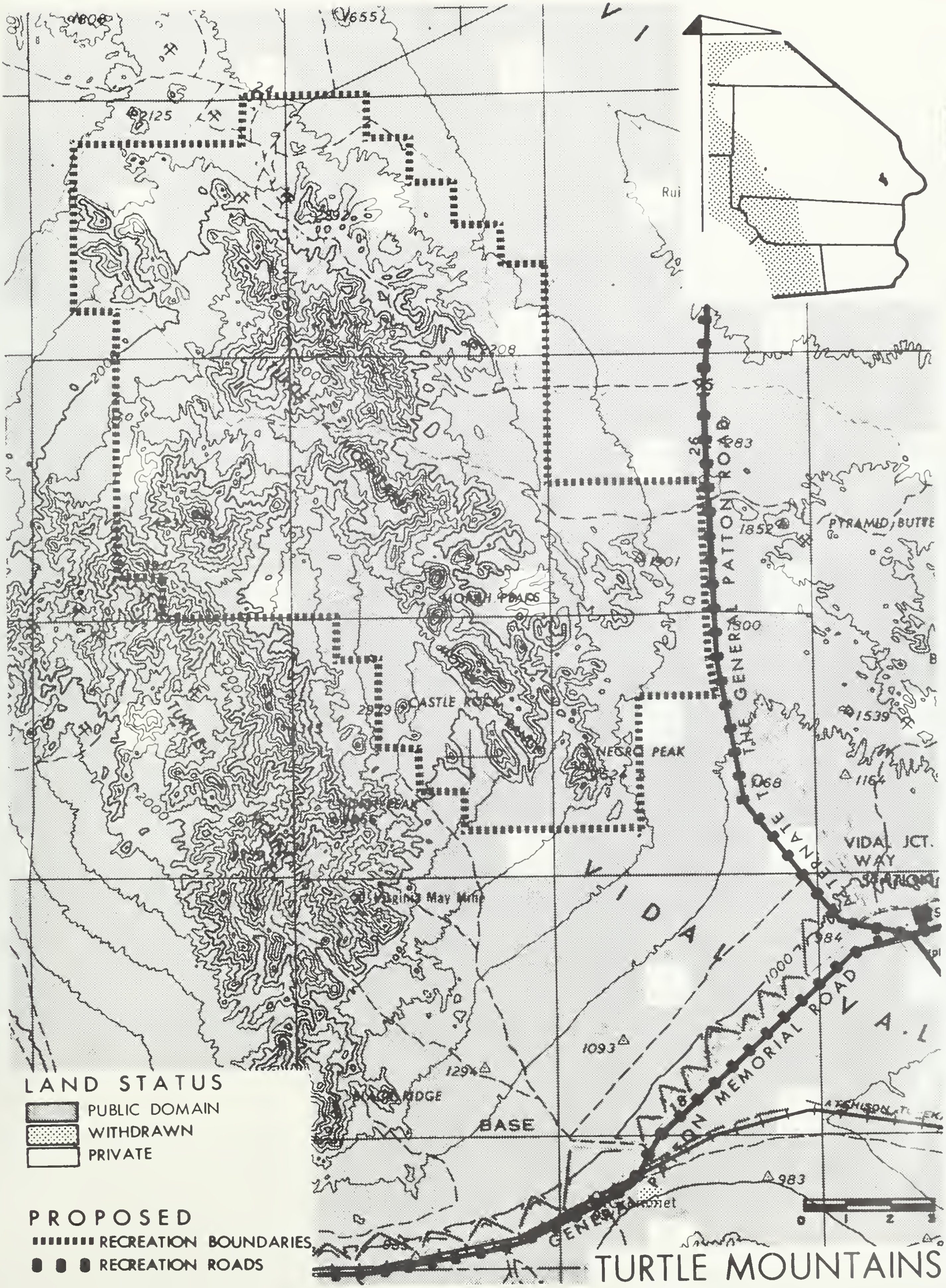
Along with some hunting of upland game birds, only casual recreation use is made of this area now, so its unusual inherent values remain much as nature conceived them.

Desert military maneuvers have scraped and scratched the desert approaches to the area, which is quite obvious from the air, but detract little from the overall scene on the ground.

Comments: The Bureau of Land Management should make every effort to keep these lands in their natural state by prohibiting any uses that would damage the tremendous recreation values. Non-Federal lands are mostly school sections and these inholdings should be acquired.

An alternate recreation road to the General Patton Memorial Road parallels this area to the east and information would be available at the proposed Vidal Junction Way Station.

In the California Desert, this area provides BLM an exceptional opportunity to preserve and eventually develop an outstanding public recreation resource. To this end, detailed studies should be pursued so that all the inherent values are known. In this way future developments can be designed in such a way that they will minimize intrusions onto the natural scene and the recreational values can be adequately interpreted to the public.


1800
1655
2125
Rui
2208
2000
26
283
THE GENERAL PATTON ROAD
1852
PYRAMID BUTTE
1801
MOHAH PEAK
1300
2879
CASTLE ROCK
TURTLE
NEGRO PEAK
1068
1539
1164
VIDAL JCT. WAY STATION
Virginia May Mine
VIDAL VALLEY
984
1000
GENERAL PATTON MEMORIAL ROAD
18
1093
1294
BASE
983
ATCHISON TOPEKA
0 1 2 3
LAND STATUS
PUBLIC DOMAIN
WITHDRAWN
PRIVATE
PROPOSED
RECREATION BOUNDARIES
RECREATION ROADS

TURTLE MOUNTAINS

WHIPPLE MOUNTAINS

Priority Group III

WHIPPLE MOUNTAINS RECREATION LANDS

Type of Area: Natural and Recreational

Land Status (approximate):

Public Domain	64,000 acres
Private	3,000 acres
Withdrawn	1,000 acres
Total	68,000 acres

Access: Access is by unimproved gravel roads from the county road leading from Vidal Junction to Parker Dam a few miles to the southeast.

Observations: These rugged, picturesque mountains provide a backdrop to the numerous recreation developments along the Colorado River and Lake Havasu. Geological values are outstanding. Biological values are above average and excellent opportunities exist for ecological study.

Only a few jeep roads penetrate the perimeter of this area and visitor use is rather light; however, hunting of quail, doves, rabbits, and some deer takes place at the present time.

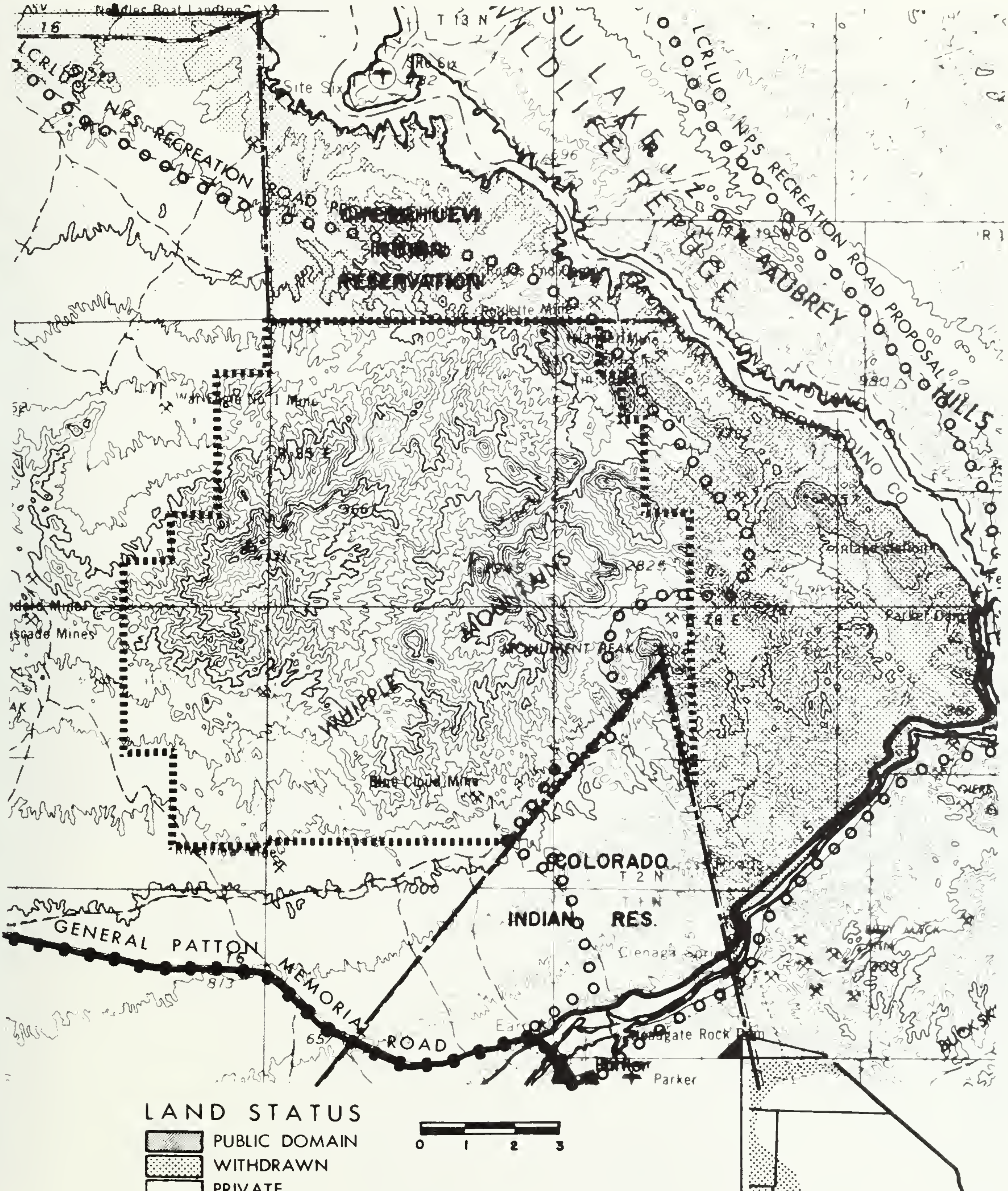
Comments: These lands are the best example of wilderness area remaining in the California Desert and they should be so managed.

The occasional elimination of hazardous conditions that develop along existing trails, the addition of other trails as public use increases, and the availability of trash receptacles and sanitary facilities at the trail heads should be the limit of investments in recreation facilities.

The few existing jeep roads would provide adequate access to the trail heads. The proposed Lower Colorado River Land Use Office-National Park Service parkway along the Colorado River would pass through the southeast corner of this area. This location should be reviewed by the Bureau of Land Management prior to approval to protect inherent values. Non-Federal inholdings, mostly school sections, should be acquired.

The proposed Vidal Junction Way Station would provide information concerning this area. Westbound travelers would obtain information at a possible Way Station that could be developed in Arizona.

GPO 976-511


Needles Boat Landing
LCRLUO NPS RECREATION ROAD
Site Six
HAVASU LAKE NATIONAL WILDLIFE REFUGE
LCRLUO NPS RECREATION ROAD PROPOSAL
CHEMEHUEVI INDIAN RESERVATION
AUBREY HILLS
Roadette Mine
SAN BERNARDINO CO
WHIPPLE MOUNTAINS
MONUMENT PEAK
Blue Cloud Mine
Parker Dam
COLORADO INDIAN RES.
T 2 N
Cienaga Spring
GENERAL PATTON MEMORIAL ROAD
Headgate Rock Dam
Parker
T 13 N
R 25 E
R 26 E
LAND STATUS
PUBLIC DOMAIN
WITHDRAWN
PRIVATE
0 1 2 3
PROPOSED
RECREATION BOUNDARIES
RECREATION ROADS

WHIPPLE MOUNTAINS

Bureau of Land Management
2002 Idaho Street
Elko, Nevada 89801

Bureau of Land Management
Library
Bldg. 50, Denver Federal Center
Denver, CO 80225

Bureau of Land Management
Library
Bldg. 50, Denver Federal Center
Denver, CO 80225

U.S. DEPARTMENT OF
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The California desert

DATE LOANED	BORROWER

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